

MOTOR AGE

Pathfinding in the South

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MEMPHIS, Tenn., April 20—Special telegram—The Glidden pathfinder reached Memphis this afternoon from Grand

Junction after being held up between Corinth and Grand Junction by heavy roads due to storms. Lewis and his party was met by Memphis motorists and a delegation from Helena, Ark., that has been in Memphis 2 days waiting to welcome the scout. They represent the Business Men's League of Helena and have hunted out the best roads between Memphis and their city. They promise excellent going from this point on to Dallas.

Tough Going in Tennessee

Grand Junction, Tenn., April 19—Special telegram—Rain storms, the heaviest recorded in this section since 1884, have greatly hampered the progress of the Glidden pathfinder over the first 500 miles of the course. Monday night was spent in a Mississippi creek bottom, where the blue clay had been turned to thin soup by the rains and freshets. The car stuck in one mudhole which seemed to be of limitless depth. Each revolution of the wheels only helped pull the car further down while its crew stood hip-deep striving with might and main to pull the car to firm ground. At length a double yoke of oxen was secured and the Chalmers was yanked out. Everyone was exhausted and as it was growing dark, Lewis and his companions spent the night in a squatters' cabin, without windows and where the bill of fare was boiled pork and corn bread, sans sugar, butter or anything else appetizing to the Glidden scouts.



GLIDDEN PATHFINDERS PASS THROUGH GREEN VALLEY, KENTUCKY



CHALMERS PATHFINDER ENCOUNTERS SHEEP NEAR HIGH GROVE

Passable dirt roads were encountered from Yellow Creek to Grand Junction, 50 miles east of Memphis, where the car spent Tuesday night. It is evident that, while the pathfinder is having its troubles, the roads will be in good shape by the time the tourists reach them in June. The condition is similar to that encountered west of Madison, Wis., last year when the pathfinding car consumed a week in going 135 miles, which was easily covered in a half a day by the contestants in the tour later on.

The rich farming country of Kentucky and northern Tennessee gave way to barren timber land as the road-hunters got down into Mississippi. The neglect to bridge streams, which made trouble in Tennessee, is not met with, but in Alabama and Mississippi the roads are mostly as nature and the first trail-cutter left them. Clay, gravel and sand are found in about equal proportions and in dry weather there would be no obstacle to a 30-mile pace all the way from Sheffield to Memphis, which will be the Sunday control. Corinth, Miss., will be the noon control the first Saturday of the tour.

There is much motoring interest in the towns of this portion of the country, as is evinced by the fact that five motorists came to Memphis Monday from Helena, Ark., to greet the pathfinders and pilot them into that city. Not only have the business men of Helena set about to put the roads in their vicinity in the best possible shape, but they also have contracted to make repairs on Tennessee highways.

E. L. Ferguson, arranging details of the tour ahead of the pathfinders, has been called on to address the business organizations on the Glidden contest and what it stands for. Mr. Ferguson also has secured the cooperation of county officials along the line, through local commer-

cial bodies, and gangs will start at once to improve the roads when they need it. The southern leg of the Cincinnati-Dallas-Chicago trip promises as smooth running as in any similar distance in any of the tours.

Sheffield Reached Sunday

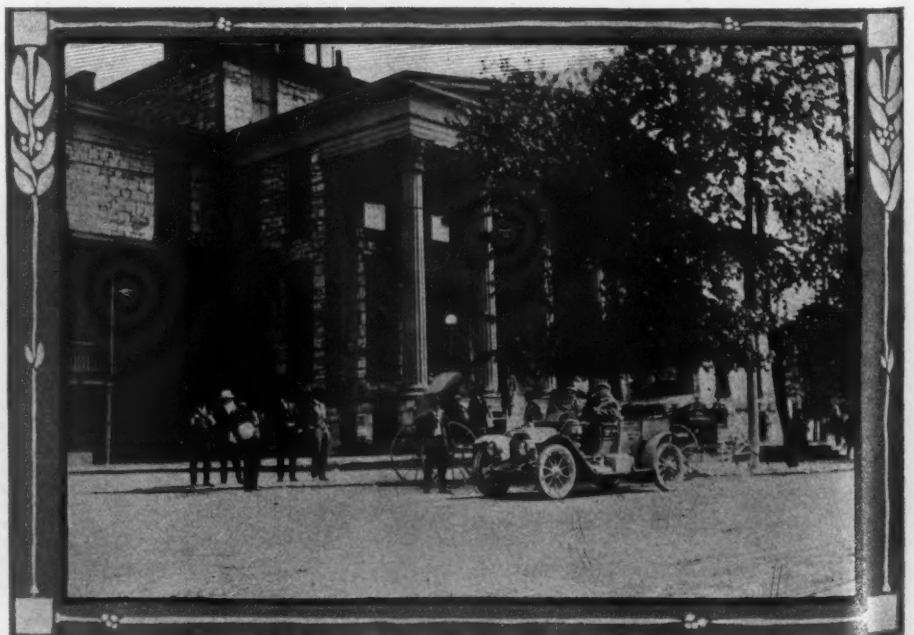
Sheffield, Ala., April 17—That the 1910 tour already is bearing fruits in the way of some very ambitious good roads planning was the cheerful information secured here by Ferguson and Lewis. A national highway from Louisville to New Orleans, following for the greater part of the distance the old military road constructed by Andrew Jackson for the transportation of troops in the war of 1812, is contemplated by the good roads advocates of Sheffield, Florence and Tusculumbia, three adjoining cities about 10 miles from the Tennessee line, having a combined population of 22,-



FORT SPRING, KY.—LEADING HORSES BY

000. As evidence that this national highway idea is not an airy dream, the counties of Laurence, Tenn., and Lauderdale and Colbert, Ala., already have started a movement which will give the Glidden tourists 100 miles of splendid running through the district. Money has been appropriated and the good offices of the county road commissioners secured.

The Commercial Club of Sheffield, W. T. Archer president, and G. H. Griffith secretary, originated the Louisville-New Orleans highway plan and its members are confident their hopes will be fulfilled. After looking the ground over carefully, Ferguson decided to recommend Sheffield, the central town of the three mentioned, for a night control during the tour.



PATHFINDER IN FRONT OF CAPITOL HOTEL AT FRANKFORT, KY.



MARSEILLES PIKE, NEAR FRANKFORT, KY.

Good roads enthusiasm struck a responsive chord in the hearts of the pathfinders. Two days were spent in making the 119 miles from Nashville to Sheffield, the heavy rains and the antipathy of Tennesseans to bridges being the causes of the slow time. The highway traveled was for most of the distance Jackson's old military road and although the red clay and loam, baptized by unusually heavy spring rains, is heavy running now, all indications are that the Gliddenites will have firm, smooth going in June.

As to bridges, or rather the lack of them. Scarcely had the Kentucky-Tennessee line been crossed when a brimming creek was encountered, which necessitated a 5-hour wait while it subsided. This was

a fair token of what was in store. Creeks which can be jumped across in dry weather are respectable water courses now and the Chalmers rushed through many under its own power, was snaked across others with a block and tackle and towed over by farmers' teams in other instances. Buffalo creek, 66 miles from Nashville, was over its banks when the explorers reached it Saturday afternoon in a driving rain. Lewis and his squad arrived just after a cyclone and attracted just about as much attention from the backwoodsmen. After hurdling through an old logging road, spending the night in a settler's cabin and supplying the community with more excitement than it has had since the war, the pathfinder was pulled to the south bank of Buffalo creek and turned its odometers back 10 miles before striking the trail again. Sheffield

field was reached just at dusk. The town, together with its neighboring sisters, has six blast furnaces. Florence, next door, has the largest wagon manufactory in the south and a fertilizer plant. The district is rich in cotton and live stock.

Lewis entertained the Alabama people with his views on the fords in Tennessee. The country has been inhabited 100 years or more and yet, so long as a mule can swim and a man crawl across on a foot log, a bridge is deemed superfluous.

The first town on the pathfinder's route after leaving Nashville was Franklin, the seat of Williamson county. It has 3,500 inhabitants and directly south of it, flanking the pike over which the tour will pass, is the battlefield where 3,000 men were killed in the Civil war.

Forty-four miles from Nashville, on Duck river, is Columbia, a town of 6,000, which probably will be a noon control. This is the county seat of Maury county, fifth richest in the state, and in the heart of the Tennessee bluegrass region. Its roads are perfect and a toll gate line through the county will be free to the Glidden tourists through the generosity of Horace Rainey, the proprietor.

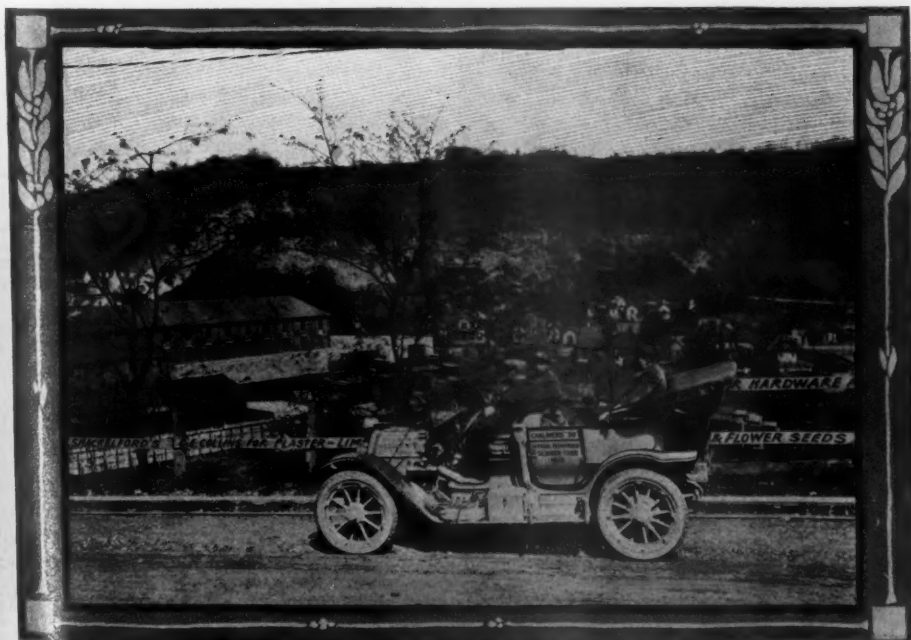
Columbia is encompassed by historical tradition and has been termed by a home-grown poet the dimple of the universe. South of Columbia through Tennessee there is little wealth, the country being broken by hills and largely uncultivated. Lawrenceburg, seat of Lawrence county, is the only town of any size whatever passed through after leaving Columbia. It is a hamlet of very unpretentious appearance.

Scouts Run Into Nashville

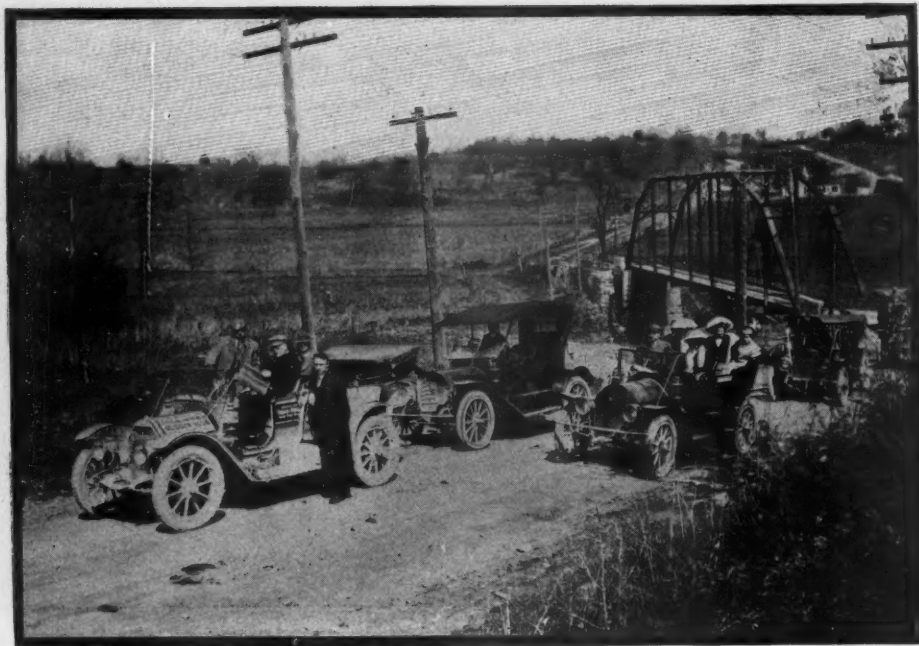
Nashville, Tenn., April 15—The second day's run of the Glidden tourists from Louisville to Nashville, as mapped by Dai H. Lewis yesterday and today, will supply as great a variety of travel conditions as will be encountered, it is likely, any-



SCOUT LEWIS TACKLES FORD NEAR MAGNOLIA, KY.



PLEASING VIEW FROM CAR OF FRANKFORT, KY.



DELEGATION MEETS THE SCOUTS AT FLOYD'S FORD



OLD-FASHIONED BRIDGE FOUND NEAR THIRSTON



OX TEAM A CURIOSITY, ENCOUNTERED NEAR BARDSTOWN, KY.

where in the Cincinnati-Dallas-Chicago run. This district has just been visited by heavy rainstorms, so what extreme difficulties the Chalmers pathfinder encountered will not be met with by the contestants. Streams which in June will be rivulets crossed by stepping stones and with no more than a few inches in them were tawny rapids today and through four of them, each one threatening to inundate the tonneau, the pathfinder plowed. These were crossed between Frankfort, Ky., and Nashville.

The boulevard-like pike which makes racing speed possible every rod of the way from Cincinnati to Louisville extends for some distance out of Louisville, and is found in stretches all along the course, which is the old Louisville and Nashville pike. But there are also some cobble-stone spots, none of them serious and some old-fashioned dirt roads down in Tennessee which are heavy now but promise to give good running when somewhat drier. Up and down the ridges of Kentucky and Tennessee are some hairpin curves which will force drivers to keep their eyes strictly to the front. Red clay and loam, with a good bottom, also was found extensively by the forerunner of the tour.

The possibilities of this part of the south from the pleasure-tourist's standpoint are manifold. The first place at which the pathfinder paused after leaving Louisville was Bardstown, famous as the place where "My Old Kentucky Home" was written and also as the location of St. Joseph's church containing seven priceless canvases presented to Bishop B. J. Flaget by his friend, Louis Philippe of France, who found refuge with the prelate when an exile. There are four distilleries here and a population of 2,000. Twenty-two of the thirty-seven cars owned in Nelson county, of which Bardstown is the seat, are in this village. Stock-raising and the making of whisky are the leading interests and the country, although only partially under cultivation owing to its hilly topography, has a wealthy aspect.

At Athertonville the scouting party found many Lincoln reminiscences and discovered an old log stable declared by reputable authorities in the region to have

More Big Tours Are Planned

Atlanta, Ga., March 17—So successful were the Georgia tours last fall that announcements are out for two series of events for this season. The New York Herald and the Atlanta Journal again have joined hands on a tour. This time the cars will go from Atlanta to New York instead of the reverse. There also will be tours to Atlanta from several southern cities and from Atlanta the tourists will push on to New York, to be there in time for the reception to Theodore Roosevelt. The tourists will leave Atlanta about June 1. The affair will be conducted along the lines of the one last year, with

been the first school attended by the war president. At Buffalo a branch road 2 miles long leads to Lincoln memorial farm and farther on at Cave City and Glasgow Junction, are by-paths to Mammoth Cave.

Bowling Green, Ky., the tentative noon control of the second day's run, is a place of 12,000 inhabitants whose chief industry is stock raising. According to local owners and dealers interest in the motor car is just evincing itself. The Western Kentucky State normal, with 1,200 pupils, is situated here. Down the pike a few miles from Bowling Green the district begins to lose some of its affluent appearance and becomes more wildly picturesque. The farms are good and it is here that civil war landmarks are found for the first time on the southern journey. At the point where the pathfinder surged across Summers' branch, ordinarily a rill, the Confederates, 15,000 strong, encamped, the first winter of the war of the rebellion.

Nashville, the day's terminus, prides itself on being one of the cities typifying in the highest degree the new progressive south. The Glidden tour, through its pathfinder, made itself felt very quickly in this city. E. L. Ferguson, tour manager of the A. A. A., arrived here just as preparations were going forward to meet the scout and found a strong sentiment in favor of a club. He was called on for a speech at a meeting of some of the local enthusiasts at the board of trade and gave them comprehensive advice as to the launching of such an organization. He recommended a democratic body with small fees and a wide scope of activity. Dai Lewis who arrived with the pathfinder about 9 o'clock, was immediately impressed and pumped for club information. By the time the tour reaches Nashville a vigorous club undoubtedly will be in existence. The city has a population of 126,000; annual bank clearances amounting to \$190,000,000. It is on the Cumberland river, in the midst of an enchanting country teeming with historical atmosphere as the center of the federal forces during the war, the home of three presidents, and is the largest milling center in the south. There are 20,000,000 people within 6 hours ride of the city of Nashville.

By the Southern Motorists

very mild rules and penalties for nothing except being late at the controls. The cities from which tourists will come to Atlanta to make the journey to New York will be New Orleans and Baton Rouge, La.; Natchez, Jackson and Meridian, Miss.; Birmingham and Montgomery, Ala.; Chattanooga and Knoxville, Tenn.; Rome, Macon, Albany, Fitzgerald, Savannah and Brunswick, Ga., and Jacksonville, Fla. The other is the Atlanta Constitution's annual Georgia state runs. Thus far no definite plans have been made beyond a general announcement that a series of runs will be made by the motorists.



PICTURESQUE SCENERY CROSSING MOUNTAINS IN KENTUCKY



PATHFINDER AT ST. JOSEPH'S CHURCH AT BARDSTOWN, KY.



GOING OVER THE MOUNTAINS TO MAGNOLIA

VELIE OPENS FIRE ON THE SELDENITES

The Moline Concern Begins Suit in Wisconsin Court for \$500,000 Against Fifty-five A. L. A. M. Companies, Charging "Unlawful Agreement or Combination in Restriction in Trade"

MILWAUKEE, Wis., April 19—The opening shot in the fight against the Association of Licensed Automobile Manufacturers was fired here today when the Velie Motor Vehicle Co., Moline, Ill., manufacturer of the Velie car, brought suit in the circuit court of Milwaukee county for \$500,000 damage against fifty-five motor car manufacturing concerns represented in the state of Wisconsin and members of the A. L. A. M., and also against the Kopmeier Motor Car Co., of Milwaukee, a dealer which, until early in the present year, was agent for the Velie cars, but which discontinued the agency in the month of February. This announcement, coming as it does on the heels of one made a week ago by the A. L. A. M., in which the association announced that seven suits would be instituted at once against as many concerns, of which the Velie was mentioned as one, ushers in one of the most interesting points in the Selden warfare which was precipitated last fall, when Judge Hough's decision in the circuit court of New York announcing the validity of the Selden patent was made known.

Claims Restraint in Trade

The Velie company, in its summons and complaint, bases its ground for action on the fact that the A. L. A. M., by various actions "does constitute an unlawful agreement or combination in restraint of trade * * * to drive such other manufacturers out of the business of manufacturing cars * * * to ruin the business of and drive out of business any and all manufacturers of cars not members of such association, including the plaintiff. The Velie company further charges the A. L. A. M. with the purpose and intent of controlling and restricting the manufacture and sale of motor cars throughout the United States, of fixing prices therefor, and of restricting and determining the output and number of cars to be manufactured."

The complaint further cites that the A. L. A. M. has induced "and is attempting to induce persons having contracts with the Velie to break said contracts and refuse to purchase and receive Velie cars * * *" and that the A. L. A. M. members "would refuse to sell such dealers any cars manufactured by them if said dealers continued to handle Velie cars." The summons charges the association with making overtures to parts or accessory manufacturers not to sell to the Velie and threatening such manufacturers that if they did members of the association would not buy from them.

The charges go further: One is that the A. L. A. M. has conspired to prevent Velie cars entering in contests and that none of

the cars manufactured by A. L. A. M. members would be permitted to compete in contests in which Velie cars are entered, the result being the prohibition of Velie machines from contests. A still further statement in the complaint is that the A. L. A. M. has prevented certain advertising agencies placing motor car advertisements from handling the Velie advertisements on the ground that if they did the advertisements of the A. L. A. M. manufacturers would be taken away from such advertising agencies.

The fourteen counts in the summons are most complete and cover the various charges very thoroughly. The companies made defendants are: Pierce-Arrow, Locomobile, Winton, Packard, Chalmers, Franklin, Columbia, Mitchell, Alco, Apperson, Autocar, Glide, Brush, Lambert, Buick, Cadillac, Corbin, Stoddard-Dayton, Elmore, E-M-F, Haynes, Hewitt, Hudson, Hupp, Jackson, Knox, Lozier, Matheson, Maxwell, Mercer, Moline, Moon, Mora, National, Marmon, Olds, Palmer & Singer, Peerless, Pierce-Racine, Pope-Hartford, Premier, Regal, Reo, Royal Tourist, Alden Sampson, Selden, Simplex, Stearns, Stevens-Duryea, Studebaker, Thomas, Waltham, Overland, York, Kissel, and Kopmeier.

The fourteen different charges are in effect as follows:

First—That the said plaintiff—the Velie company—is a corporation organized under the laws of the state of Illinois * * * that its business is the manufacture and sale of motor cars. That plaintiff has invested \$750,000 in such * * *. That during the year 1909 plaintiff manufactured and sold more than 900 cars * * * and that for the year 1910 has contracted for material and is prepared to and will, unless interfered with by the unlawful acts of defendants, manufacture and market 3,000 cars.

Second—That the Mitchell-Lewis Motor Car Co., the Kissel Motor Car Co., and the Pierce Motor Co., are corporations organized in the state of Wisconsin, and engaged in the manufacture of cars in said state.

Third—That the fifty-five defendants, mentioned above, are engaged in the business of manufacture and sale of cars and carry on such business within the state of Wisconsin.

Fourth—That the Kopmeier Motor Car Co., a Wisconsin organization, is engaged in selling motor cars in the city of Milwaukee and adjacent parts of the state.

Fifth—Upon information and belief the plaintiff alleges that the defendants, other than the Kopmeier Motor Car Co., * * * have formed a certain unlawful combination, confederacy or agreement, under the

name and style of the Association of Licensed Automobile Manufacturers, for the purpose and intent, as the plaintiff is informed and verily believes, of controlling and restricting the manufacture and sale of cars throughout the United States, of fixing prices therefor, and of restricting and determining the output and number of cars to be manufactured throughout the United States, both by the said combination of defendants and of other persons not in said combination. That the A. L. A. M. is intended to and does constitute an unlawful agreement or combination for the restraint of trade; that if the intent and purpose of the A. L. A. M. to compel all manufacturers of cars in the United States to join it upon terms and conditions fixed by its members, or in default of such manufacturers joining the A. L. A. M. to drive such other manufacturers out of the business of manufacturing cars. And upon information and belief this plaintiff alleges that it is the purpose and intent of the A. L. A. M. to ruin the business of and drive out of business any and all manufacturers of cars not members of the association, including the plaintiff.

Sixth—That pursuant to such combination, agreement, and confederation, the A. L. A. M. notified the plaintiff to become a member of such association and as a condition thereof demanded that plaintiff should pay \$14,000, and in future should pay from time to time additional sums according to the number of cars manufactured, and that plaintiff should restrict the number of cars to be manufactured in 1910 to 2,500, and in 1911 to 2,000.

Claims Threats Were Made

Seventh—That the plaintiff refused to enter into such combination * * * and that thereupon defendants, through their authorized agents, threatened and warned the plaintiff that unless it joined said association and acceded to its demands, that the several defendants, constituting the A. L. A. M., would interfere with the business of the plaintiff and prevent plaintiff from carrying on its business in the manufacture of cars, and would injure and ruin plaintiffs' business and in effect put plaintiff out of business.

Eighth—Plaintiff alleges that defendants constituting the A. L. A. M. conspired and confederated together to injure, damage and destroy the business of the plaintiff, and that said defendants are attempting and have induced persons having contracts with plaintiff for the purchase of cars to break these contracts and to refuse to purchase and receive from plaintiff cars contracted for and to be purchased from; and further that in order to procure such breaking of contracts, the defendants constituting A. L. A. M. have representative dealers in motor cars having contracts with the plaintiff, or who

A. L. A. M. STARTS SUITS IN MICHIGAN COURT

were accustomed to purchase cars from plaintiff, that in case such dealers fulfilled their contracts with the plaintiff, or purchased cars from plaintiff, they, the defendants, would refuse to sell to such dealers any cars manufactured by them; and further the plaintiff believes that defendant, members of A. L. A. M., have procured manufacturers of materials and parts used by plaintiff in the manufacture of cars to break these contracts with the plaintiff for the sale of such materials and parts, in some cases by neglecting and failing to make deliveries of such material, and in others by delaying deliveries, contracted to be made, so as to greatly embarrass and hinder the plaintiff in the manufacture of cars; and the plaintiff is informed and believes that defendants are urging manufacturers of material and parts, used by the plaintiff, in the manufacture of cars, not to sell to the plaintiff, and are threatening such manufacturers that if they do sell to the plaintiff, that said defendants will refuse to deal with, or purchase material from such manufacturers selling to the plaintiff, and thereby inflict upon such parts and material manufacturers a damage greater than they would suffer if they refused to deal with the plaintiff, or even broke contracts which said manufacturers had with the plaintiff.

Other Charges Made

Ninth—The plaintiff further alleges that the defendants, members of A. L. A. M., have conspired together, and are conspiring together, to prevent the proper advertising of cars manufactured by the plaintiff, and to that end have notified and are notifying the promoters of various races and contests for hill-climbing and otherwise, that if such promoters permit Velie cars to be entered that none of the cars manufactured by said defendants will be permitted to compete in such races or contests, thereby compelling such promoters to refuse Velie entries. And the plaintiff further alleges that said defendants constituting the A. L. A. M., are trying to prevent and have prevented advertising agencies from taking advertisements of Velie cars by threatening that if such agencies receive the advertisements of the plaintiff or its agents, advertising Velie cars, that then and in such case the defendants would withdraw their advertising from such agencies, thereby causing great loss and damage to the plaintiff, and interfering with the advertisements of the plaintiff or the goods manufactured by it.

Tenth—This section refers to the charges against the Kopmeier Motor Car Co., and cites that on or about November 1, 1909, this company entered into a contract with the Velie concern for the exclusive right of selling these cars in the city of Milwaukee, county of Milwaukee, and adjacent counties in Wisconsin, contract to run until

Through Columbia Motor Car Co. and George B. Selden, Judge is Asked to Enjoin Seven Companies From Alleged Infringement of Patent Governing Internal Combustion Engines

DETROIT, MICH., April 16.—Application for injunction was made today in the United States district court, the nominal plaintiffs being the Columbia Motor Car Co. and George B. Selden and the defendants the Paige-Detroit Motor Car Co., the Anhut Motor Car Co., the Warren-Detroit Motor Car Co., the Carhartt Automobile Corporation, the Imperial Automobile Co., the Abbott Motor Co., the Owen Motor Car Co. and the Demotcar Co. The court is asked to enjoin the defendants against further alleged infringement on the Selden patent, governing the use of internal-combustion engines.

These are the suits mentioned in the last issue of Motor Age as imminent. The list differs but slightly from the original one, the attorneys for the owners of the

patents having changed it slightly to include what they consider the concerns which are genuinely producing and marketing unlicensed cars in the district.

Simultaneously similar suit was begun in the northern division of the same court against the Flint Wagon Works, of Flint, the W. A. Peterson Co. of the same city.

Little stir marked the inauguration of the important litigation which is likely to prove so important a feature of the summer. The papers were filed by Attorney James Whittemore. The defendants were given until June 7 to enter an appearance and until July 1 to make a formal answer. The plaintiffs then have 20 days for their replication. Ninety days for the taking of proofs will still further prolong the litigation.

October 31, 1910, and that the Kopmeier company agreed to purchase not fewer than fifty cars. The plaintiff alleges that for 5 days, commencing February 22, 1910, the date of the Milwaukee motor car show, the Kopmeier Motor Car Co., was induced by the defendants to break its contract with the Velie company and to refuse to exhibit the Velie car at the show. The plaintiff alleges that the defendants notified the Kopmeier Motor Car Co., that if it continued to deal in Velie cars, to carry out its contract with the company, and to exhibit said cars at the show, that the said defendants would not sell, nor permit to be sold to the Kopmeier company any cars manufactured by any of them and would cause the agencies, held by the Kopmeier company representing the defendants or some of them, to be withdrawn, thereby injuring the Kopmeier company.

Eleventh—This section deals with a certain advertising agency in New York, which was notified and advised by defendants, that if it placed matter advertising Velie cars that the defendants would cause damage and loss to such agency to the extent of \$75,000 a year, so that said agency refused to handle Velie advertising matter.

Twelfth—The plaintiff alleges that the defendants, individually and through their agencies and representatives, have endeavored to prevent such manufacturers of motor cars as are not members of the A. L. A. M. from procuring credit from the banks and other financial institutions for the purpose of carrying on their business, and have endeavored to induce bankers to refuse to extend credit, or make loans to manufacturers of cars who are not members of the A. L. A. M. The plaintiff further alleges that the said defendants are endeavoring to induce dealers handling licensed cars to refuse to ac-

cept in trade any second-hand car manufactured by any person, firm, or corporation not a member of the A. L. A. M., and, further, that said defendants have threatened that they will not allow any but members of the A. L. A. M. to exhibit at the national shows at New York, Chicago, and Boston, and will not permit any manufacturer of accessories for cars who exhibits at shows other than those conducted by the A. L. A. M., to exhibit at any shows conducted by the association; and, further, that defendants are threatening and attempting to prevent dealers of cars from handling plaintiff's cars and other manufacturers' cars who are not members of the association, by organizing associations among said dealers for the purpose of handling only licensed cars.

Asserts There Is Conspiracy

Thirteenth—Plaintiff alleges that said defendants maliciously and unlawfully contriving, plotting together and conspiring by means of said threats and intimidations, have wickedly and unlawfully, induced prospective purchasers of cars from the plaintiff to refuse to purchase such cars, and have unlawfully and fraudulently induced dealers in cars to break their said contracts for the purchase of plaintiff's cars, and have induced advertising agents to refuse to advertise plaintiff's cars, and that by said threats, intimidations, and inducements have injured and damaged the plaintiff's business.

Fourteenth—The plaintiff alleges that the said defendants, individually, and through their agents, and representatives, are unlawfully endeavoring to prevent plaintiff carrying on its business by causing its agents to break their contracts, and by rendering it impossible for plaintiff to secure necessary material for manufacturing his cars and by interfering with the advertising of the plaintiff.

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Sound Principles for a Sound Industry

FROM the big cities all over the country come continual reports of dealers cutting prices and allowing excessive values in trading in second-hand cars. Everybody knows that there is a standard 20 per cent profit for practically all dealers on a motor car, and while on a \$5,000 car the profits look large, yet it has to be figured out that the dealer has to pay his rent, hire his own help, conduct his own business, and spend money on a lot of the cars after they have been delivered, and do a score or more other things, this profit gradually dwindles. It is a fact, however, that many dealers who have not made much money during past seasons, have failed to count closely enough on their profit margin, and while they figured they could allow one-half their profit to a buyer in order to make the sale, they fail to realize that the other half was not enough to pay for the actual expenses connected with the deal. The undoubted reason why so many dealers have not made money is because of giving part of their legitimate profits to some buyer who thinks he has special right to such and also by allowing other buyers too much for their second-hand cars.

THE motor car business is the same as any other business, and if a man is to continue in it as a dealer or manufacturer he must have his profits, because that business does not exist which can be conducted without profits to meet the normal expenditures. Dealers expecting to conduct their business by giving away one-half or three-quarters of their profits are working their own ruin, and are not making friends of those to whom they sold their cars. Every man who is in the field to buy a car has during his lifetime bought other objects, and knows that people who sell goods must make profits, but the mystery is why the dealer wants to give away his profit. If he were to meet the buyer in a common-sense argumentative way in nine cases out of ten he would make the sale and have the profit to himself. A buyer must realize that if the dealer does not make anything out of the sale he cannot expect anything in the way of treatment after he has bought his car. It is impossible to give the buyer a profit on a machine and then go to any expense whatever after he has bought it in fixing up little troubles and making repairs. Every common-sense buyer would realize this if the dealer would simply explain it in a rational light.

WHAT holds true with reference to dealers giving away profits also holds true with reference to the second-hand phase of the question, or the taking in of second-hand cars in trade for a new car. This is a common source of trouble to dealers. Mr. A will allow \$800 for a certain second-hand car, Mr. B. will allow \$1,000, Mr. C. will allow \$1,500 and Mr. D. will allow \$1,800. These figures are no exaggeration. Mr. D. cannot possibly continue in business by such a high allowance if he is selling a reasonably-priced car, and how can the buyer who has taken the new car from him expect anything after he has bought the car, when he has more than taken all the profit in value on his old car which has been traded in? In trades of this nature it is injurious to the industry where fabulous prices are allowed second-hand cars, and it is a direct injury to the dealer who engages in such foolish enterprise.

EVERY business generally finds its own level in the industrial world, and there is no business which should occupy any higher level than the motor car industry of today. It cannot occupy a high level if dealers will continue giving away their profits to buyers, and

also continue allowing excessive valuations on second-hand cars taken in payment for new machines. No legitimate business man would have special confidence in an industry which is conducted on such a basis, or will the legitimate buyer expect any dealer to give away his legitimate profits, because if he did that buyer would come to one or two conclusions, namely, the dealer cannot continue in business or he must charge so excessively for repairs or have a particularly poor car listed at a fabulous price. Business is business, whether manufacturing and selling motor cars, sewing machines or needles, and it must be conducted on business principles if it is to retain the confidence of the public, and it cannot continue in the public confidence by such methods as have already been referred to.

THE one reason why many dealers have not made as much money as they should out of their business is that they have failed to keep proper account of what their cars cost them. A dealer is in the habit of taking in a second-hand car, spending time overhauling it, putting on new tires, painting and doing many other improvements without knowing the exact cost in labor and replacements for the work. After the car is sold he is frequently required to spend money on it, and if all of these items are not carefully checked up that dealer will find that instead of just breaking clear on a second-hand deal he is the loser to the extent of a few hundred dollars. Losing \$100 on each car taken in on trade means considerable by the end of the year. What dealers need as much as anything in a great many cases is better methods of conducting their business. They should install business systems, whereby they know what repairs cost them. The days of excessive charges for repair work are passing, and, while it has been possible to make money with many because of excessive charges, when these prices are reduced to normal the entire business will fall off.

THAT industry is a healthy industry in which everybody connected with it is making a reasonable profit. Industries where all concerned are receiving their due profits have the confidence of all other industries. Industries in which many are losing money are not looked upon with favor. There is no reason why everybody connected with the motor car business should not have his due profit. The demand for cars is so great that the necessity of giving away the profit should not arise, and where it does it can be in many cases ascribed to lack of real salesmanship. The sooner this price cutting and trading proposition is placed on a sounder basis than it is, generally speaking, today, the better for all concerned and the better for the industry at large. Dealers could do much to clarify the situation if they would meet in unprejudiced bodies and look the situation fairly in the face, but where they cannot do this there is little hope of them satisfactorily solving the problem themselves. It is a fact that in several cities the credit of many dealers is below par. This should not be. The industry warrants a much higher standard. Facts are facts, and the reason of this credit situation is in many cases caused directly by giving away profits and poor deals in second-hand cars. There are in every city in America those agents who hold to the legitimate profit basis, and they are proving and will continue to prove the bulwark of the industry. Those dealers who keep open 7 days in the week and 24 hours in the day are not going to be the winners in the long run. Every industry will find its own level and may the motor car soon reach a high mark.

MOTOR DEVELOPMENT OF WESTERN CANADA

WINNIPEG, Man., April 16—Just 7 years ago the first motor car was imported into western Canada, thus inaugurating what may be justly termed the motor age of the west. It was a little, three-wheeled affair which bore very slight resemblance to the modern motor car. To the late Professor Kendrick, of Manitoba university, belongs the honor of having thus introduced motoring to this country. When his friends laughed at his car with its long controller, which seemed to have been built with a view to converting it into a tongue to pull the car home in case of accident, he simply advised them to watch developments.

During the summer of 1903 two other cars were purchased by citizens of Winnipeg, representing along with Professor Kendrick's pioneer, an investment of about \$4,000. Today there are over 1,200 cars in the prairie provinces, representing an investment of considerably over \$3,000,000, and motoring is growing so in popularity that agencies and factories are unable to supply the demands of this country.

The year 1904 saw the number of cars so increased that the organization of the Winnipeg Automobile Club was decided upon. There were only about half a dozen members, and only five cars were seen in the first club run. The officers of the club at its inauguration were: President, ex-Mayor Arbutnot, now a mining magnate of the Pacific coast; vice-president, Dr. Webster; secretary, A. C. Emmett.

From this comparatively unpromising and humble beginning the Winnipeg Automobile Club has developed into the governing body of motoring in this country, with a membership today of over 300, or nearly half of the owners of cars in the city of Winnipeg. Every movement towards the best interests of motoring and motorists has been either promoted or cordially endorsed by this club, which has been in no small measure responsible for the universal popularity which the motor car enjoys in this country today. From its very inception the members went to work unitedly and resolutely to campaign for good roads, properly charted touring routes throughout the provinces, social features and race meetings, all of which were calculated to instill interest and to give an added zest to the sport.

Year by year it has gone on broadening its scope and widening its influences, until today it is recognized as the sole governing body of motoring in the Canadian west. Its agitation for good roads has borne splendid fruit, and as a result everywhere throughout the province there is a well-defined policy among the municipalities to have the best trunk roads possible. This movement has the hearty support of the government, which has appointed engineers to supervise the work and to assist with

Winnipeg Automobile Club Has Been Big Factor in Promotion Line and Securing Good Roads

advice and suggestions wherever improvements are in progress or are contemplated. Should the Winnipeg Automobile Club never accomplish anything else in its career its efforts for good roads entitle it to the thanks of the country, and have more than justified its existence.

Numerous extended tours and race meetings have been arranged under the auspices of the club, and many desirable tours and trips have been carefully charted so as to prevent any inconvenience or trouble for motorists on the trail. These are being constantly added to, and the condition of the roads and bridges is carefully watched.

Legislation affecting motoring also has received very careful attention from the club members and executive, and if the province of Manitoba today enjoys what is regarded as the best motor vehicle law on the continent it is due entirely to the

efforts of the Winnipeg club, which has always kept in close touch with legislation. The executive has never been unreasonable in opposition nor in demands in this respect, but has, on the contrary, endeavored to meet every situation in a spirit of fairness. Not only has it done much to remove criticism and fractious opposition by this attitude but it has consistently made it a duty of its officers to endeavor to have the laws as placed upon the statutes observed by all motorists. Joy riding and similar offenses against the law which may endanger the life of pedestrians or others are sternly discountenanced by the Winnipeg club and it has appointed a vigilance committee to prevent such insane tactics by instituting prosecutions of offenders through its own solicitor and at the club's expense.

The latest move of this progressive organization is to secure a site for country club headquarters about 20 miles from the city in a most picturesque part of the country, admirably served by good roads. Here a commodious and luxurious club house will be erected this year with a garage in connection sufficient to accommodate twenty-five cars. Every luxury for the comfort and convenience of the club members will be provided, including a billiard room, smoking room and card room, two private and one public dining rooms, bedrooms, tennis court, bowling lawn, etc. The club has been incorporated under the presidency of R. M. McLeod, one of the most enthusiastic motorists in the west.

The program for the Winnipeg Automobile Club for the current year has not yet been definitely drafted, but a number of features have been decided upon by the executive committee. These will be as follows:

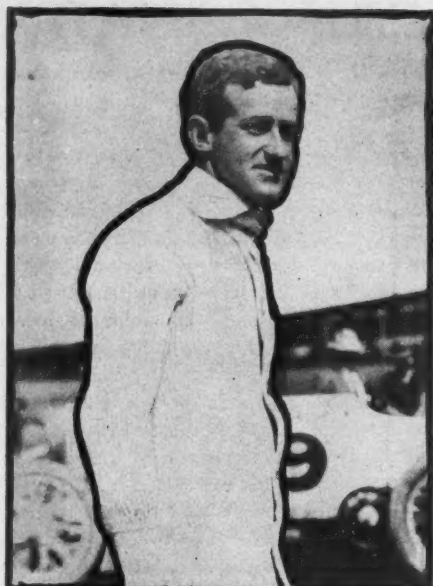
July 1—Provincial meet of motorists at Portage la Prairie.
July 13—Commencement of exhibition race meeting, economy and reliability tests, etc., at Winnipeg industrial exhibition.
August—Annual tour of club; route not yet chosen.
September 4—Labor day; annual Dunlop trophy race and fall race meeting combined.
October—Smoking concert to wind up season.
Porte-Marke trophy—In addition to the above events a competition will be inaugurated for a valuable trophy. It has not yet been decided what form the contest for this handsome trophy will take.

The officers of the club for the current year are as follows: President, C. H. Newton; vice president, D. B. Sprague; secretary-treasurer, W. E. Wright.

The disbanding of the Manitoba Motor League a few weeks ago leaves no other influential organization in the Canadian west except the Winnipeg club to supervise the interests of the motorists, but as it has been the pioneer in this respect and so long intrusted with the bulk of such work it is safe to assume that it will continue to exert an influence which will be felt and appreciated not only by every owner, but by the general public as well.

Coming Motor Events

- April 23-29—Second annual show at Bangor, Me.
- April 28—Economy run of Chicago Motor Club to Lake Geneva and return.
- April 30-May 2—Reliability run to Atlantic City, Quaker City Motor Club, of Philadelphia.
- May 5-6-7—Speedway races at Atlanta, Ga.
- May 9—Road race at Santa Rosa, Cal.
- May 9-10-11—Reliability run of Motor Club of Harrisburg, Pa.
- May 13-14—Track meet of Motor Contest Association, Brighton Beach, New York.
- May 15—Track meet of Santa Rosa Automobile Association, Santa Rosa, Cal.
- May 18-19—Reliability run of Norristown Automobile Club, Norristown, Pa.
- May 19-20-21—Reliability run of Automobile Club of Hartford, Hartford, Conn.
- May 22—Reliability run, Fort Worth Star-Telegram, Fort Worth, Tex.
- May 29—Spanish voiturette road race for Catalunya cup.
- May 27-28-30—Speedway meet at Indianapolis.
- May 30—Track meet of Bay State Automobile Association, Boston.
- May 28-30—Track meet of Automobile Club of Kansas City, Kansas City, Mo.
- May 30—Hill-climb of Automobile Club of Bridgeport, Bridgeport, Conn.
- May 30—Decoration day road race of Denver Motor Club, Denver, Colo.
- May 29-30-31—Speedway meet at Los Angeles, Cal.
- May 27-31—Reliability run of Washington Post, Washington, D. C.
- June 1—Road races of Motor Contest Association, Riverside, L. I.
- June 4—Track meet of Quaker City Motor Club, Philadelphia.
- June 4—Annual hill-climb of Worcester Automobile Club, Worcester, Mass.
- June 11—Annual Giant's Despair hill-climb, Wilkes-Barre, Pa.
- June 11—Road races of Portland Automobile Club, Portland, Ore.
- June 18—Hill-climb of Upper Westchester A. C., Ossining, N. Y.
- June 15-29—Annual Glidden tour. Start Cincinnati, finish Chicago.
- July 1-2-4—Speedway meet at Indianapolis.
- July 1-10—Road carnival of licensed dealers at Los Angeles, Cal.
- July 2—Reliability run of North Wildwood Automobile Club, Philadelphia.



BRAGG, CONQUEROR OF OLDFIELD

LOS ANGELES, CAL., April 18—The first meet on the new board track at Playa del Rey came to an end yesterday afternoon, successful indeed so far as rec-

Records Broken On Board Track

ords are concerned, but being shy as to entries necessary to sustain interest spread over 7 days of racing. Every speedway mark from 1/2 mile up to and including 200 miles was broken and to cap the climax Caleb Bragg, an amateur, driving a 90-horsepower Fiat, defeated Barney Oldfield in straight heats in a match race at 2 miles, run Saturday and Sunday.

From the standpoint of finance the meet was not such a success. The largest crowd was 12,000 and there were several poor days. There are several reasons for such a condition. The track is 14 miles from Los Angeles; the weather for the opening was not the best and the promoters were under an enormous expense. Several of the stars received large bonuses, the expenses of A. A. A. officials were paid and the money prize list was a big one. All this ate into the receipts. This does not mean that the opening was a failure—simply that the 20,000 and 30,000 crowds expected did not materialize. Another

explanation may be that Los Angeles has had too much racing.

The track itself showed that it was well fitted for fast work. Walter Hempel, manager of contests, provided some of the most interesting racing ever seen on the coast. The pie pan is well fitted for the fastest stock cars but cars have difficulty keeping straight when making miles under :40. Oil dropping on the boards is an obstacle to contend with, for running on this oil cars have a tendency to skid. This can be overcome by use of a sand blast.

The time tape now is in the hands of Chairman Butler of the contest board and an official list of records will be issued soon.

Statistics of the meet are interesting, especially those referring to the time. The figures show that the racers traveled 72 miles in the time trials at an average speed of 92.01 miles per hour; 735 miles in competition at an average of 70.44 miles per hour and that the average time for the combination was 75.99 miles per hour.

So far as the drivers and cars were concerned Harroun in the Marmon counted best, winning five firsts, two seconds and one third in the 7 days of racing. De Palma in the Fiat won four firsts, one second and one third; Endicott in the Cole four firsts and two seconds; Bragg in the Fiat three firsts and two seconds; Oldfield in the Knox three firsts, one second and two thirds. Robertson in the Simplex captured two firsts and two seconds, Lescault in the Palmer-Single won a race and Fords won two. Nikrent in a Buick took two firsts and two seconds. Livingston in a Stoddard also won once.

The last 3 days of the motordrome meet opened Friday with two 10-mile races between Oldfield and de Palma as the features. Oldfield drove his Knox six and de Palma the stock Fiat. The honors were even, each winning a race. The first meeting was for cars under 600 cubic inches piston displacement. Four passed the starter and at the flag Livingston in the Stoddard-Dayton shot to the front. De Palma was right after him and these two soon had a commanding lead on Oldfield and Harroun.

The Stoddard showed a wonderful burst of speed and was 50 feet in front of the

DETAILED SUMMARY OF RACES SATURDAY, APRIL 16

Ten miles, stock chassis, class C, division 2; 161-230 cubic inches displacement									
Car	H.P.	B.	S. P. Dis.	Driver	1	2	3	4	5
Buick	4-20	3 3/4	3 3/4	J. Nikrent	1	1	1	1	1
Cole	4-30	4	4	Endicott	2	2	2	2	2
Firestone	4-26	4	4	Linthwaite	3	3	3	3	3
Warren-Detroit	4-30	4	4 1/2	Miller	4	4	4	4	4
Time—8:40.17. Rolling start									
Ten miles, free-for-all, stock chassis, class E; under 600 cubic inches displacement									
Car	H.P.	B.	S. P. Dis.	Driver	1	2	3	4	5
Flat	4-60	5 1/2	5 1/2	De Palma	2	2	2	2	2
Knox	6-60	5	4 3/4	Oldfield	4	4	4	4	4
Marmon	4-35	4 1/2	5	Harroun	3	3	3	3	3
Stoddard-Dayton	4-50	5 1/2	5 3/4	Livingstone	1	1	1	1	2
Time—7:38.33. Rolling start									
Ten miles, free-for-all, class D. First heat									
Car	H.P.	B.	S. P. Dis.	Driver	1	2	3	4	5
Cyclone	4-60	5 1/2	5 1/2	De Palma	3	3	3	3	2
Flat	4-90	5 1/2	7 3/4	Bragg	2	2	2	2	1
Darracq	4-100	6 1/2	5 1/2	Kerscher	1	1	1	1	1
Time—7:11.62. Rolling start									
Ten miles, stock chassis, class C, division 5; 451-600 cubic inches displacement									
Car	H.P.	B.	S. P. Dis.	Driver	1	2	3	4	5
Knox	6-60	5	4 3/4	Oldfield	1	1	1	1	1
Flat	4-60	5 1/2	5 1/2	De Palma	3	3	3	2	2
Stoddard-Dayton	4-50	5 1/2	5 3/4	Livingstone	2	3	2	3	3
Time—7:22.92. Rolling start									
Fifty miles, stock chassis, class C, division 4; 301-450 cubic inches displacement									
Car	H.P.	B.	S. P. Dis.	Driver	5	10	15	20	25
Marmon	4-35	4 1/2	5	Harroun	1	1	2	1	1
Marmon	4-30	4 1/2	4 1/2	Wade	2	2	1	2	2
Chalmers-Detroit	4-49	5	4 3/4	Free	3	3	3	3	3
Buick	4-40	4 1/2	5	J. Nikrent	1	1	1	1	1
Time—39:53.55. Rolling start									



CARS COMING OUT OF THE PADDOCK AT PLAYA DEL REY

TIME TRIALS APRIL 16

Bragg in Fiat 90		
	By laps	Time
One-half mile	:20.25
Kilometer	:25.13
One mile	:40.08
Two miles	1:20.52
Three miles	2:00.40
Four miles	2:40.71
Barney Oldfield in Benz		
One-half mile	:18.57
One mile	:36.99
Benny Kerscher in Darracq		
	By laps	Time
One mile	:42.50
Two miles	1:25.88

But First Meet Not a Money-Maker

Fiat at the end of 5 miles. Then some trouble developed and de Palma went to the front, winning easily. Oldfield qualified for the solid ivory championship in this event as it was discovered when he pulled up to the paddock that his brake had been half-set throughout the race. In the next meeting with de Palma Oldfield led throughout the entire 10 miles, and established a new record for the class by winning in 7:22.92.

In the 10-mile free-for-all, Ben Herscher in the Darracq led for 7 miles. He then threw the right rear tire and brought his car under control with the greatest diffi-

culty. At the time the tire flew off Herscher was traveling over 80 miles an hour. The tire rolled under the rim of the piepan for 200 feet and then bounding 50 feet in the air leaped over the outside fence. De Palma in the Fiat won the race.

The little Buick, with Nikrent driving, also established a new speedway record for the 161-230 class by winning a 10-mile race from the Cole in 8:40.17. A new speedway record for the 301-450 class 50 miles was established by Harroun in the Marmon, his time being 39:53.55. In the second mile of this race the Buick broke a steering knuckle and Nikrent had a very narrow escape. The car slid from the track into a dirt bank but was brought to a stop before turning turtle. A heavy wind off the ocean in the early part of the day had the effect of making the time a few seconds slow.

Racing on Saturday

Los Angeles, Cal., April 16—After the failure of Oldfield and his Benz to meet de Palma's Fiat it was thought they surely would come together at the Los Angeles



GIVING THEM THE FLAG

motordrome, but once again the Fiat has disappointed and these two noted drivers have failed to meet.

Oldfield was ready and anxious but de Palma was unable to get his car in running order. He tried out during the early part of the meet but could not make

TIME OF RACES APRIL 15

Ten-mile, stock chassis, 161-230 cubic inches:			
Miles	Laps	Time	Miles
1...	54.60	54.60	6...
2...	50.75	1:45.35	7...
3...	51.93	2:37.28	8...
4...	51.47	3:28.75	9...
5...	51.55	4:20.20	10...

Ten mile, free-for-all, under 600 cubic inches:			
Miles	Laps	Time	Miles
1...	45.91	45.91	6...
2...	44.52	1:30.43	7...
3...	44.30	2:14.73	8...
4...	44.28	2:59.01	9...
5...	44.49	3:43.50	10...

Ten-mile, free-for-all:			
Miles	Laps	Time	Miles
1...	42.14	42.14	6...
2...	40.59	1:22.73	7...
3...	42.45	2:05.18	8...
4...	42.69	2:47.87	9...
5...	40.98	3:28.85	10...

Ten-mile, stock chassis, 551-600 cubic inches:			
Miles	Laps	Time	Miles
1...	44.68	44.68	6...
2...	42.94	1:27.62	7...
3...	42.67	2:10.29	8...
4...	44.22	2:54.51	9...
5...	44.10	3:38.61	10...

Fifty-mile, stock chassis, 301-450 cubic inches:			
Miles	Laps	Time	Miles
1...	48.07	48.07	26...
2...	46.64	1:34.71	27...
3...	46.64	2:21.35	28...
4...	46.83	3:08.18	29...
5...	47.45	3:55.63	30...
6...	47.57	4:43.20	31...
7...	47.64	5:30.34	32...
8...	48.60	6:19.44	33...
9...	49.68	7:09.12	34...
10...	50.45	7:59.57	35...
11...	51.17	8:50.74	36...
12...	47.50	9:38.24	37...
13...	48.41	10:26.65	38...
14...	49.17	11:15.82	39...
15...	49.17	12:04.99	40...
16...	48.93	12:53.92	41...
17...	47.67	13:41.59	42...
18...	47.57	14:29.16	43...
19...	47.77	15:16.93	44...
20...	47.47	16:04.40	45...
21...	47.84	16:52.24	46...
22...	48.53	17:40.77	47...
23...	49.20	18:29.97	48...
24...	50.44	19:20.41	49...
25...	48.28	20:08.69	50...

TIME OF RACES APRIL 16

Five-mile stock chassis, 301-450 cu. in.:			
Miles	Laps	Total	Miles
1...	48.68	0:48.68	4...
2...	46.01	1:34.69	5...
3...	45.98	2:20.67	

Ten-mile stock chassis, 457-600 cu. in.:			
Miles	Laps	Total	Miles
1...	46.43	0:46.43	7...
2...	43.88	1:30.31	8...
3...	43.66	2:17.17	9...
4...	43.34	3:04.51	10...
5...	43.24	3:51.75	

Two-mile match race. First heat:			
Bragg, Fiat.....	1	50.46	0:50.46
Oldfield, Benz.....	2	38.27	1:28.73

Two-hour race. Free-for-all:					
Hours	Leader	Miles	Hours	Leader	Miles
0:15	Marmon	18	1:15	Marmon	93
0:30	Marmon	37	1:30	Marmon	111
0:45	Marmon	55	1:45	Marmon	130
1:00	Marmon	74	2:00	Marmon	148

DETAILED SUMMARY OF RACES SATURDAY, APRIL 16

Five miles, stock chassis, class C, division 4; 301-450 cubic inches displacement									
Car	H.P.	B.	S. P. Dis.	Driver	1	2	3	4	5
Buick	4-40	4 1/2	5	J. Nikrent	2	2	2	1	1
Marmon	4-35	4 1/2	5	Harroun	1	1	1	2	2
Marmon	4-30	4 1/2	4 1/2	Wade	3	3	3	3	3
Time—3:52.68. Rolling start									
Ten miles, stock chassis, class C, division 5; 451-600 cubic inches displacement									
Car	H.P.	B.	S. P. Dis.	Driver	1	2	3	4	5
Knox	6-60	5	4 3/4	Oldfield	3	1	1	1	1
Stoddard-Dayton	4-50	5 1/4	5 1/4	Livingston	2	2	2	2	2
Fiat	4-60	5 1/2	5 1/2	De Palma	1	3			
Time—7:30.66. Flying start									
Match race. Best two out of three heats. Distance, 2 miles. First heat									
Car	H.P.	B.	S. P. Dis.	Driver	1	2			
Fiat	4-90	5 1/2	7 1/2	Bragg	1	1			
Benz	4-200	3 7-10	7 1/2	Oldfield	2	2			
Time—50.46, 1:28.73. Standing start									
Two-hour race, free-for-all, stock chassis class E.									
Car	H.P.	B.	S. P. Dis.	Driver	1/4	1/2	3/4	1	1 1/4
Marmon	4-35	4 1/2	5	Harroun	1	1	1	1	1
Fiat	4-60	5 1/2	5 1/2	De Palma	4	4	3	2	2
Stoddard-Dayton	4-50	5 1/4	5 1/4	Livingston	2	2	2	2	2
Marmon	4-30	4 1/2	4 1/2	Wade	5	3	4	3	3
Knox	6-60	6	4 3/4	Oldfield	2				
Palmer-Singer	6-60	4 1/2	5 1/2	Lescault					
Corbin	4-30	4 1/2	4 1/2	Free					
Dorris	4-30	4 1/2	5	Siefert					
Distance—148 miles. Standing start									



VIEW OF THE PLAYA DEL REY TRACK, SHOWING THE FINISH LINE

DETAILED SUMMARY OF RACES SUNDAY, APRIL 10

Fifteen miles, stock chassis, class C, division 1; 160 cubic inches piston displacement and under

Car	H.P.	B.	S.	P. Dis.	Driver	1	3	5	7	9	11	13	15
Fiat	4-12	3½	3½	118.9	DePalma	1	1	1	1	1	1	1	1
Isotta volturette	4-14	2½	2½	54.12	Marquis	2	2	2	2	2	2	2	2
Hupmobile	4-12	4½	3½	112.	Kelly	3	3	3	3	3	3	3	3

Time, 17:07.81

Five miles, Chanslor and Lyon handicap, free-for-all, class D

Car	H.P.	B.	S.	P. Dis.	Driver	Hdcp.	5	1	2	3	4	5
Palmer-Singer	6-60	4½	5½	615.9	Lescault	1:00						
Stoddard-Dayton	4-50	5½	5½	486.1	Livingston	0:35						
Isotta	4-45	5½	6	495.1	Marquis	0:35						
Marmion	4-30	4½	4½	286.3	Harroun	0:30						
Darracq	4-100	6½	5½	787.2	Kerscher	0:05						
Simplex	4-90	6.1	5½	672.16	Robertson	8.						
Cole	4-30	4	4	201.1	Endicott	1:10						
Hupmobile	4-18	3½	3½	112.	Kelly	3:00						

Time, 3:23.16

Five miles, stock chassis, class C, division 2; 161-230 cubic inches piston displacement

Car	H.P.	B.	S.	P. Dis.	Driver	1	2	3	4	5
Buick	4-20	3½	3½	165.6	Nikrent	1	1	1	1	1
Cole	4-30	4	4	201.	Endicott	2	2	2	2	2
Firestone-Colum.	4-26	4	4	201.	Linthwaite	3	3	3	3	3
Warren-Detroit	4-30	4	4½	226.2	Miller	4	4	4	4	4

Time, 4:23.21

Five miles, stock chassis, class C, division 3; 231-300 cubic inches piston displacement

Car	H.P.	B.	S.	P. Dis.	Driver	1	2	3	4	5
Marmon	4-30	4½	4½	286.3	Harroun	1	1	1	1	1
Dorris	4-30	4½	5	283.6	Siefert	2	2	2	2	2

Time, 3:55.97.

Five miles, free-for-all, class D

Car	H.P.	B.	S.	P. Dis.	Driver	1	2	3	4	5
Fiat	4-90	5½	7½	608.6	Bragg	3	3	2	1	1
Simplex	4-90	6.1	5½	672.16	Robertson	2	1	1	2	2
Darracq	4-100	6½	5½	787.2	Kerscher	1	2	3	3	3

Time, 3:15.89

Fifty miles, stock chassis, Venice sweepstakes, class C, division 5; 451-600 cubic inches piston displacement

Car	H.P.	B.	S.	P. Dis.	Driver	5	10	15	20	25	30	35	40	45	50
Isotta	4-45	5½	6½	495.1	Marquis	4	3	1	1	1	1	1	1	1	1
Stoddard-Dayton	4-50	5½	5½	486.1	Livingston	3	1	3	3	3	3	2	2	2	2
Apperson	4-55	5½	5½	597.2	Hanshue	1	2	2	2	2	2				
Knox	6-60	5	4½	559.5	Oldfield	2									

Time, 39:20.69

Five miles, free-for-all handicap

Car	H.P.	B.	S.	P. Dis.	Driver	Hdcp.	5	1	2	3	4	5
Simplex	4-90	6.1	5½	672.16	Robertson	8.						
Palmer-Singer	6-60	4½	5½	615.9	Lescault	0:50						
Stoddard-Dayton	4-50	5½	5½	486.1	Livingston	0:35						
Marmon	4-30	4½	4½	286.3	Harroun	0:40						
Isotta	4-45	5½	6	495.1	Marquis	0:35						

Time, 3:28.28

The committee also reported a bill embodying changes in the present law, but unless the house revises some of these changes they will not carry out the intentions of the motorists. One of the more important of these, containing a so-called reciprocity clause, is really a misnomer. Under the present law cars could come into the state for 10 days without registration, and when the matter of a change was brought up because Representative Willets wanted to get back at Rhode Island where the law says outside cars can only remain 10 days in any year there, the reciprocity plan was advocated.

Under the proposed reciprocity scheme the motorists sought to convey the idea that we should treat motorists from other states exactly as their states treated Massachusetts motorists. Representative Wil-

lets accepted that idea. Now, however, in reporting the change it states that a car may be operated in Massachusetts 10 calendar days in any 1 year, provided the state from which a motorist hails grants similar privileges to Massachusetts men. In other words, it puts a barrier up so that if a man from a state that grants Bay state men 15, 20 or 30 days leeway, or does not exact any provisions, he only has 10 days in the Bay state. Some of the other New England states—for instance, Maine, New Hampshire or Vermont—have no such provisions and this law would be a slap at their men who would come over the line more than ten times, so that it is not really reciprocal. It would lead to reprisals by those states later against Bay state motorists.

Another matter that was brought out

strongly was that needless arrests were made for not blowing a horn at every crossing, and it was supposed that this would be eliminated. Here again the committee has not made progress, but has in fact retrograded, and strikes at one part of the accessory business, the makers of some of the horns now on the market. The change makes it all right in the open country so the operator need not slow up except where the view is obstructed, but the provision for cities and towns simply says that no horns shall be sounded, except the ordinary reed horns. So the Gabriel, Klaxon, Siren, Jericho and others of that kind are barred, and a man who has one on his car must also equip the machine with the ordinary bulb reed horn. There also is a provision that a driver must not allow an unreasonable amount of smoke to escape, but how that is going to be enforced unless policemen qualify as experts on motoring and smoke is an enigma. It also declares that drivers must not use the muffler cut-out.

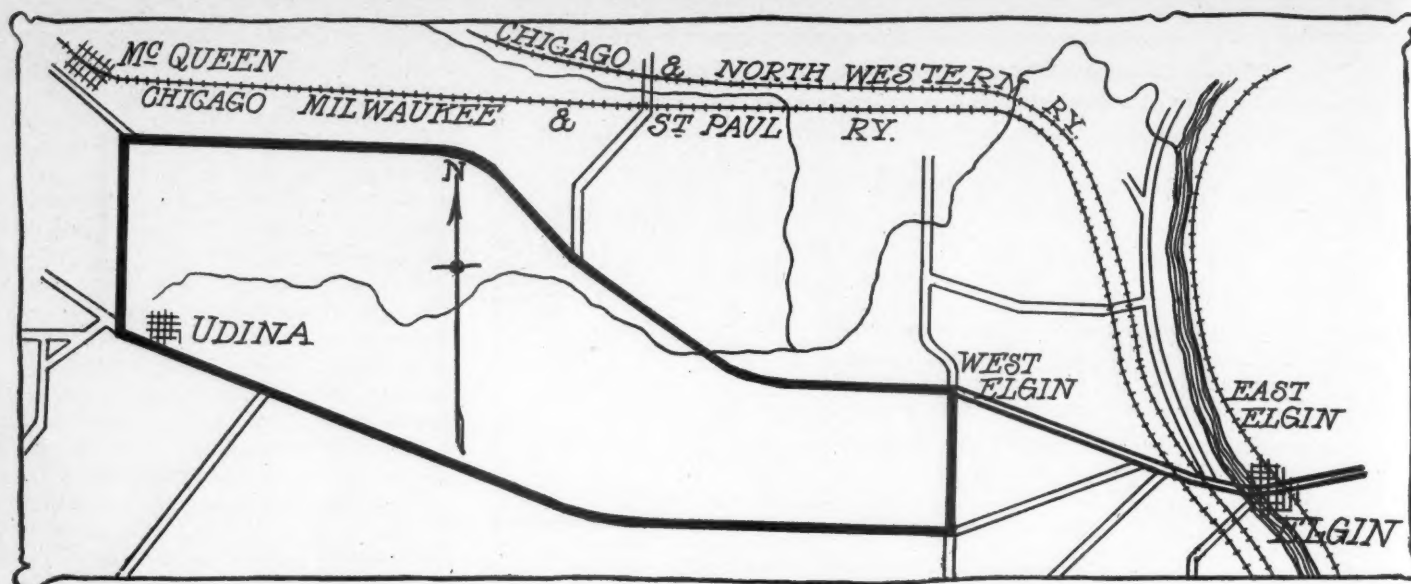
BRUSH COMPANY MAY MERGE

Detroit, Mich., April 19—That only a matter of a few days intervenes before the formal announcement of the sale of the Brush Runabout Co. to the United Motors Co. became increasingly evident today when a large number of the most important men in the latter corporation arrived in Detroit and proceeded to make an inspection of the Brush and other Detroit factories. The party, which was headed by President Benjamin Briscoe of the United States Motors, came here from Newcastle, Ind., where it had been occupied for some time, at the big plant of the Maxwell company, the most important member of the group. The party also includes Secretary F. D. Dorman and Treasurer Carl Tucker of the United States Motors, as well as Richard Irving and J. D. Maxwell of the Maxwell company. A number of district managers of the Maxwell-Briscoe also made the trip. All were entertained here by Alex I. McLeod, head of the local district branch, and Robert K. Davis, the local manager. President Frank Briscoe of the Brush Runabout Co. admitted that the visit of the United States Motors people might terminate in the purchase of the Brush. He insisted, however, that the sale had not been consummated. Benjamin Briscoe admitted that the sale was possible.

COMPARITIVE TABLE OF RECORDS MADE AT LOS ANGELES, ATLANTA, INDIANAPOLIS AND BROOKLANDS

Distance.	Los Angeles		Atlanta		Indianapolis		Brooklands	
	Time	Car and driver	Time	Car and driver	Time	Car and driver	Time	Car and driver
1 kilo	:22.18*	Benz, Oldfield			:26.2*	Benz, Oldfield	:17.76*	Benz, Hemery
½ mile	:17.91*	Benz, Oldfield					:14.07*	Benz, Hemery
1 mile	:36.22*	Benz, Oldfield	:37.71*	Fiat, Strang	:39.21*	Fiat, Strang	:31.05*	Benz, Hemery
5 miles	3:15.62*	Fiat, De Palma			3:17.70*	Fiat, Strang		
10 miles	6:31.37	Simplex, Robertson	7:01.94	Fiat, Strang	8:15.90	Benz, Oldfield		
25 miles					21:21.70	Benz, Oldfield		
50 miles			40:14.02	Fiat, Robertson	44:21.20	National, Aitken	32:50.99	Thames, Smith
100 miles	1:16:21.90	Marmon, Harroun	1:22:35.35	Fiat, Robertson	1:31:41.90	National, Aitken	1:06:53.49	Thames, Smith

* Flying start



CIRCUIT AT ELGIN, ILL., ON WHICH CHICAGO MOTOR CLUB PLANS RUNNING ROAD RACE NEXT FALL

Road Race for Chicago is Possible

CHICAGO, April 18—A stock chassis road race run by the Chicago Motor Club is one of the possibilities of the present season, the first step in that direction being taken last Friday night when a committee from the club attended a meeting called by the citizens of Elgin, Ill., for the purpose of considering the proposition. Elgin has a natural course which was discovered by Frank Wood, manager of the Chicago Knox branch, and a recent inspection of it by the motor club brought about a desire on the part of its officers to use it for racing purposes. Elgin citizens spoken to in regard to the matter were favorably impressed and the meeting Friday night was the result.

Big enterprises like this are not put through in a day or even a week, and therefore the meeting did not make any decision in the matter. The Elgin citizens listened to the talk of the motorists as to the advantages the town would derive through having such a big event run at its very doors, seemed impressed with the idea and wound up by appointing a committee consisting of M. M. Cloudman, a leading coal dealer of the town; W. W. Willson, publisher of an Elgin paper, and Fred. W. Jenks, manager of the opera house. This committee has undertaken to canvass the situation thoroughly and secure from the business men of Elgin a guarantee fund of \$15,000 with which to promote the race. This committee has promised to report by May 1 and from the talk of the evening it was believed that the report will be a favorable one.

According to the plans outlined at the meeting, the Chicago Motor Club favors holding the race the latter part of August or the first part of September, possibly asking the contest board of the American Automobile Association to make it a national stock chassis event now that Lowell, Mass., has decided it will not promote that

classic this year. It is figured that the expense of putting on such a race would not be great because of the natural advantages offered by Elgin, which is only 38 miles from Chicago and with excellent transportation both by electric trolley and by railroad. The course itself is at the end of Highland avenue and exactly 1 mile from the business center of the town. A trolley runs within 100 feet of the course, while at the northwest corner of it is the McQueen railroad station. The course itself is gravel the entire distance, and the exact distance around is 8.4 miles. At the present time the road is in need of scraping which would not involve a very great expenditure of money. Scraped and oiled, it would be as fast as a circuit at Riverhead, Long Island, it is believed, and it ought not to cost much more than \$8,500 to put it into racing condition.

It is almost certain the Chicago Automobile Club will not promote a road race this year, which leaves an excellent opening for the Chicago Motor Club, which already has planned a strenuous campaign for 1910, including an economy run on April 28; a demountable rim test in May; the annual hill-climb at Algonquin, Ill., in August; and the 1,000-mile reliability in October. Also, it will be prominent in the reception of the Gliddenites upon the finish of the tour in this city, having put up the Chicago trophy for the roadster division of the big national tour.

SAVANNAH NO SECOND FIDDLE

Savannah, Ga., April 17—No grand prize or any other kind of races will be held here this year. This was decided at a meeting recently held by the Savannah Automobile Club to consider a proposition made by the Automobile Club of America. In a letter that was read it stated that the grand prize race would be held on the motor parkway in October, but that a

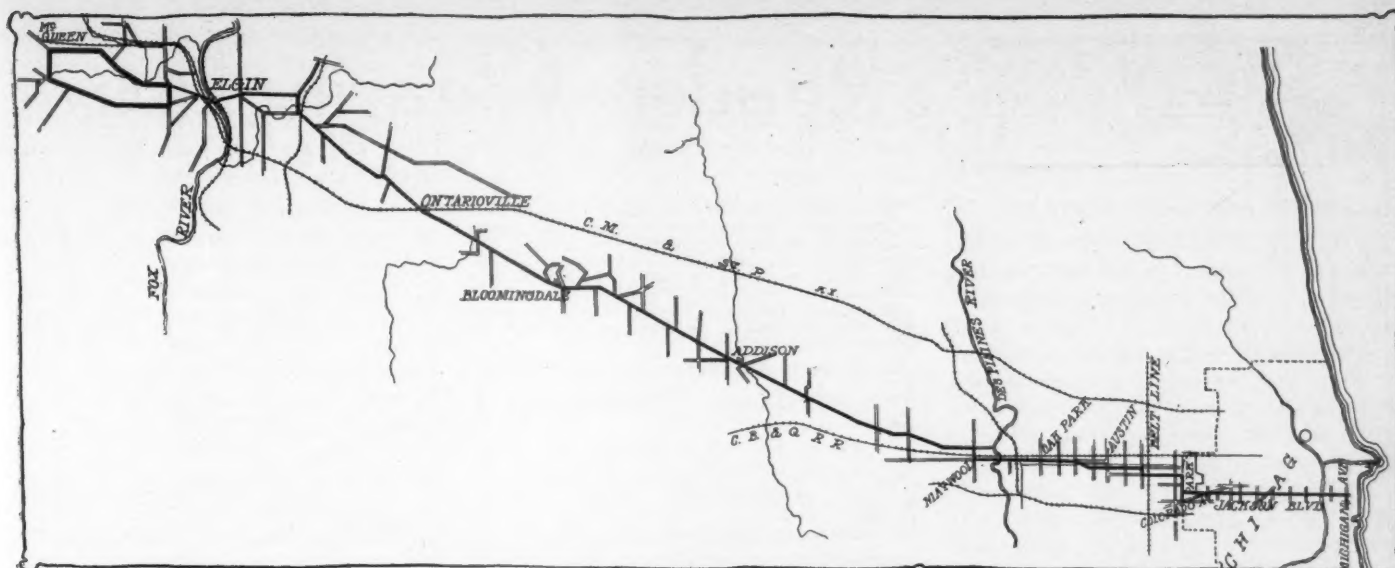
second big race could be held in Savannah right after. It was decided at this meeting not to play second fiddle. Mayor Tiedeman sent a telegram to this effect and a return one was received in which it was stated that nothing else could be done by the A. C. A.

MERGER RUMORS DENIED

New York, April 19—Special telegram—Reports circulated rather vigorously during the past week to the effect that J. P. Morgan & Co. were preparing to merge several large motoring interests have been met with sharp denials. The chief of these rumors was that the United States Motor Co. and the General Motors Co. were to be amalgamated. J. P. Morgan, Jr., entered a positive denial of the alleged merger as far as the great banking house is concerned and W. C. Durant of the General Motors Co. was equally forceful in stating the position of his company so far as they refer to the General Motors Co. Said Mr. Durant in speaking of the current reports:

"There is not a word of truth in them. The General Motors Co. is not interested in any merger pending or prospective and wish to state that the published and reiterated reports that J. P. Morgan & Co. had any part in the formation of the General Motors Co. is without semblance of truth. I might add that J. P. Morgan & Co. have no interest in the General Motors Co. at present as far as I know.

"For over a year this company has carefully refrained from denying fanciful and baseless stories published about antecedents and activities. Such denials would congest news space in many publications and if we had attempted to make them the work involved would have proved burdensome. Another viewpoint from which this situation might be examined is that the public is likely to look upon the denials of news and alleged news as a certain variety of undignified publicity. The company wishes to avoid giving ground



MAP SHOWING ROAD RACE CIRCUIT AND ITS PROXIMITY TO CHICAGO

for such an impression, which ought to be sufficient reason for our silence during a long period of misrepresentation. The company is not for sale."

ANOTHER A. L. A. M. DEALERS' BODY

Philadelphia, Pa., April 19—Special telegram—A meeting of the dealers of this city who handle cars licensed under the Selden patent was held tonight for the purpose of forming the Association of Licensed Automobile Dealers of Philadelphia. J. A. Wister, of Gawthrop & Wister, agents for the Elmore, was chosen permanent chairman and J. H. Beck, secretary of the Philadelphia Automobile Trade Association, permanent secretary.

Coker F. Clarkson, assistant general manager of the Association of Licensed Automobile Manufacturers, who had been invited to attend by Mr. Wister, addressed the meeting, outlining the scope of the Selden patent and its advantages to both the purchasers and dealers. At the conclusion of Mr. Clarkson's remarks the chairman was authorized to appoint a committee of five to arrange for a permanent organization, and to submit at the next meeting nominations for officers and draft of constitution and bylaws.

ORGANIZE IN KANSAS CITY

Kansas City, Mo., April 20—Special telegram—The squabble among the motor dealers of Kansas City took a new turn this afternoon when an application for a pro-forma decree of incorporation of the Dealers' Licensed Automobile Association of Kansas City was filed in the circuit court. The officers named in the petition are George A. Bond, president; J. R. Histed, vice-president; A. M. Blake, secretary, and H. G. Kirkland, treasurer. These men hold the same offices in the Kansas City Automobile Dealers' Association and intend to retain their membership in both organizations. The members of the new organization will be restricted to agents of motor cars licensed under the Selden patent.

Assembly Passes the Callan Bill

ALBANY, N. Y., April 19—Special telegram—The Callan bill regulating the motor vehicle traffic of New York state passed the assembly in Albany this afternoon with only three dissenting votes. The rural members made a desperate attempt before the final vote was taken to reduce the speed limit in the country districts, which under the bill is 30 miles an hour and 15 in villages.

The bill prohibits the making of local ordinances regulating motor traffic except in the case of first-class cities and these must be made and submitted before the taking effect of the bill which is the first of August, this year.

The registration fees provided in the bill are \$5 for a car of 25 horsepower or less; \$10 for more than 25 and less than 35; \$15 for more than 35 and less than 45 and \$25 for any motor vehicle having a rating of 45 horsepower or over. For all commercial vehicles the registration fee is \$5 per year.

It is expected that over \$1,000,000 per year will be realized for the state, which will be turned over to the state highway commission to be used in road maintenance and improvement. There is a reciprocal clause in the bill exempting non-resident owners from taxation providing the state in which they live has a similar law regarding tourists from this state.

Any person operating a car while in an intoxicated condition will be guilty of a misdemeanor and whoever causes injury to any person or property and goes away without stopping to make himself known is guilty of a felony and punishable by a fine of not more than \$500 or imprisonment for 2 years or both.

No person will be allowed to operate a car who is under 18 years of age unless accompanied by a duly licensed chauffeur or owner of the car. The rate of toll on turnpikes, plank roads, etc., is fixed at the minimum rate allowed by law for a

vehicle which is drawn by two horses.

The bill has been practically agreed upon by all parties interested except that the motor clubs and allied interests contend the rate of registration to be too high. By its passage the bill will abolish the speed trap nuisance in the state. The senate undoubtedly will affix its approval to the bill tomorrow.

DEATH OF C. L. McINTOSH

Milwaukee, Wis., April 20—Charles L. McIntosh, president of the Pierce Motor Co. of Racine, and treasurer of the J. I. Case Threshing Machine Co. of Racine, died early Tuesday morning at Naples, Italy. Mr. McIntosh was stricken on April 6. With Mrs. McIntosh and several friends he was on his return from a tour of the world, begun last January. Mr. McIntosh was a native of New York. He was born 63 years ago and was for many years secretary of the Jewel Belting Co. of Hartford, Conn. He opened a bank in Denver, Colo., leaving this to become associated with the Milwaukee Harvester Co., now part of the International Harvester Co. In 1897 he was instrumental in reorganizing the J. I. Case Threshing Machine Co. of Racine, becoming treasurer. About a year ago he played an important part in the reorganization of the A. J. Pierce Motor Works at Racine, now the Pierce Motor Co.

CLAIMS EXCLUSIVE LICENSE

Chattanooga, Tenn., April 20—Announcement has been made here this week by the American Lava Co., manufacturer of burners for acetylene lamps, that with the cancellation by the Brays of England of a license to its competitors under patent No. 629,961, the exclusive lava burner license passes to it—the American Lava Co.—control, thereby giving it the sole right to manufacture and sell lava or steatite acetylene gas burners of the regulating variety.



The Readers' Clearing House

GASOLINE AND CARBURATION

STEVENS POINT, Wis.—Editor Motor Age—Through the Readers' Clearing House will Motor Age kindly answer the following questions?

1—If any make of carbureter is adjusted properly and the engine and ignition are working all right, should not the carbureter work all right regardless of the grade of gasoline that is used?

2—Does not each state have a law specifying that all gasoline should have a certain gravity test? If so, why is this law not enforced?—A Subscriber.

1—There are grades of gasoline which are so poor that an ordinary carbureter cannot be adjusted to properly vaporize them; within reasonable limits, however, almost any standard make of carbureter will work all right. The more volatile the fuel, the more readily it is carbureted. It is difficult to understand just what you mean when you say that the carbureter should work all right; the object of a carbureter is to vaporize the liquid fuel and regulate the proportions of fuel and air, and as long as it accomplishes this it is working all right. But, if the fuel is of a poor or unsuitable grade the motor will not deliver as much power as when a suitable grade of fuel is used, however well the carbureter may be working.

2—Motor Age knows of no law regulating the specific gravity of gasoline, but states have laws requiring a fire test above a certain temperature.

EXCITING MOTOR SPORT

Great Bend, Kan.—Editor Motor Age—The accompanying photograph shows two of our citizens returning home from a coyote hunt on the Cheyenne bottom, which is a low flat about 9 miles wide

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.

To the Readers of the Clearing House columns:

Motor Age has insisted of late on bona fide signatures being attached to every communication published in these columns. It has come to the attention of Motor Age that some signatures, which apparently have been bona fide, have proven otherwise, in that communications addressed to them have not been received and the postal authorities have replied that such parties are unknown. Where cases of this kind arise, an investigation will be made and the correct names of the offending parties published. Motor Age has in the past discovered the correct name and address of one party guilty of wrong signature and will spare no efforts in the future to hunt down other offenders of this nature.

and 13 miles long, the greater part of which is covered with water. The latter part of December this lowland was frozen over and the two men with their Sterling car ran down seven out of eight coyotes in a little over 6 hours. How is this for winter sport?—Louis Selle.

OVERHAULING A MAXWELL

St. Charles, Ill.—Editor Motor Age—I have just finished putting a little Maxwell car into shape for the summer, and having met with fair success I thought that other readers of Motor Age who are putting their own cars into condition might be interested in the process. The little car was used continually all last summer and part of the winter, and ran beautifully until around about

November, when it began to lose a little of its power and miss occasionally. The roads were in pretty bad shape then and the weather being too severe to enjoy motoring, the car was run into a corner of the garage, jacked up onto a few blocks of wood and the greater part of the air pressure let out of the tires. When it was decided to bring it back into service, I just pumped up the tires again, let it down off the blocks, flushed the remaining anti-freezing solution out of the radiator, filled her up with fresh oil, gasoline and water, and started it up. It seemed to run well enough idle but when I tried it on the road it was found that there was still a loss of power; one cylinder was very weak and often failed to fire at all. I then decided to give it the spring cleaning advised in the Repair shop section of your publication.

I pulled out all the tools that came with the car—it was a shame to do it, they were packed in so nicely; it was well that I did, however, for I found at the bottom of the tool box, an instruction book which advised just how the car should be cared for, what would happen if this or that were neglected, and how to overcome the diseases developed through negligence. From the information contained in the booklet, I had no trouble in making a correct diagnosis of the case. It was carbon deposit and corrosion of the valve seats. I started on the weakest cylinder, removed the spark plug, valve caps and the compression-relief cock at the under side of the cylinder. The piston was then brought into the position closest to the cylinder head, and the valves were removed. The intake valve was in fairly good shape but the exhaust valve was badly pitted. I experienced some trouble in removing the valves because, either the valve lifter furnished was a false alarm, or I did not know how to work it. However, with everything cleared for action, and with a home-made tool such as is shown in Fig. 1, I scraped the carbon from the piston head and from the walls of the valve and combustion-chambers, as the loose carbon would accumulate at the lower side of the combustion-chamber. I would flush it out through the hole from which the compression cock was removed. In this way I got the cylinders so clean that you could eat out of them. Valve grinding came next. A cloth C was stuffed into the valve ports to catch any emery that might drop from the valve. About half a thimbleful of fine emery was poured into a small tin; about two thimblefuls of cylinder oil was poured over it, and the emery stirred around in it. A little of this paste was then applied to the valve seat with a finger and with a spring S behind the valve V as shown the grinding commenced with a brace and screw-driver bit as illustrated in Fig. 2. The valve was not turned



RESULT OF DAY'S HUNTING ON KANSAS LOWLANDS

round and round, but was oscillated on its seat by moving the handle of the breast drill back and forth about 4 or 5 inches, and the valve drawn about $\frac{1}{2}$ inch away from the seat every few seconds to distribute the oil and emery. This is where the spring S came in handy, for it was only necessary to slightly release the pressure on the breast drill and the spring would force the valve away from the seat without disengaging the screwdriver bit from the slot in the head of the valve. It took about 2 hours to completely remove the pits and get a good seat on the exhaust valve, with the old emery paste removed and fresh paste applied every few minutes; the last half hour, however, was employed in polishing the valve seats with just plain kerosene oil, applied in the same manner as the emery paste. The intake valve really required no grinding but I ground it a little and polished it, just to satisfy my conscience; because if you neglect a little thing on a motor, and it doesn't run like a top afterwards, you will never be satisfied till the motor is again torn apart and the wrong made right.

After the valves were ground and polished, they were tested by marking the seats transversely with a lead-pencil as shown at M in Fig. 3, with the marks about $\frac{1}{2}$ inch apart or a little less; the valve then was put into place, and oscillated about $\frac{1}{4}$ inch. All marks were erased and I was satisfied that they would not leak. The same operation was repeated with the other cylinder; it being a two-cylinder horizontal motor.

More trouble was encountered when an effort was made to replace the valve springs, and my fingers were pretty sore till I remembered a kink once illustrated in a motor publication. I then secured some string, compressed the spring in the vise and tied it up as shown in Fig. 4; and then when the spring was slipped over the valve-stem, with its spring-seat and retainer pin in place, it was only necessary to cut the cords—and Presto! no obscene language, no more sore fingers, thanks to the journal that communicated the idea to my mind, it alone was worth the price of its subscription.

The crankcase of the motor was the next thing on the program, the little plug on the top of the case, which also serves to support the wires from the commutator, was removed; the plug at the bottom of the case was also removed and the old oil allowed to run out; the case was then flushed out with kerosene by squirting it in through the top with a squirt-gun and allowing it to run out at the bottom. The old oil which was drained from the motor was caught in a can, and the same amount of fresh oil put in to replace it, when the case was clean and bottom plug replaced. The cover of the gearset was next removed and it was treated in the same manner as the crankcase of the motor. After the gearset, came the universal joints of the propellershaft, and they certainly needed attention. Being

under the car they had never been oiled since the car left the factory, and the bearings were almost dry. Finding the first joint in this condition, both were entirely dis-assembled, thoroughly oiled and packed with grease. It might be well to insert here that before tackling the dis-assembly of any part, it was first cleaned up thoroughly with a brush and gasoline, and I might add that a round stiff-haired paint brush of medium size comes in very handy for this sort of work. After the universal joints, a fresh supply of grease was added to that in the rear axle; then every joint and working part of the car, inside and outside of the frame, in front and behind the dash, was cleaned up with the brush and gasoline. This cleaning-up process was followed by an oiling-up process with an oil can, and not a joint was missed. I started at the motor on one side of the car and moved back and around the car, putting a few drops of oil on every movable part or bearing I could find. When this job was completed the engine was started, she ran as smoothly as a sewing machine, and did not miss an explosion. The instruction book was again consulted for instructions in regard to carburetor and clutch adjustments, and following these, said adjustments were made, and now the car is just as powerful, and runs better than ever.—A Constant Reader.

CORRECTION IN INQUIRY

Lafayette, Ind.—Editor Motor Age—Referring to my communication published in Motor Age, issue of February 10, 1910, first column, page 62, the word "inches" occurring in two places should have been feet. Please note this correction.—A L. Sheridan.

SPRING REPAIR

Chicago—Editor Motor Age—I have heard considerable comment among dealers of cars as to the success with which leaves of springs, which were broken, can be welded. Personally, I have not met

with much success in this respect, and would like to hear from readers of Motor Age who will give, in these columns, their experiences with reference to broken springs in cases where they had welded them, how long the weld endured and how it was effected.—Reader.

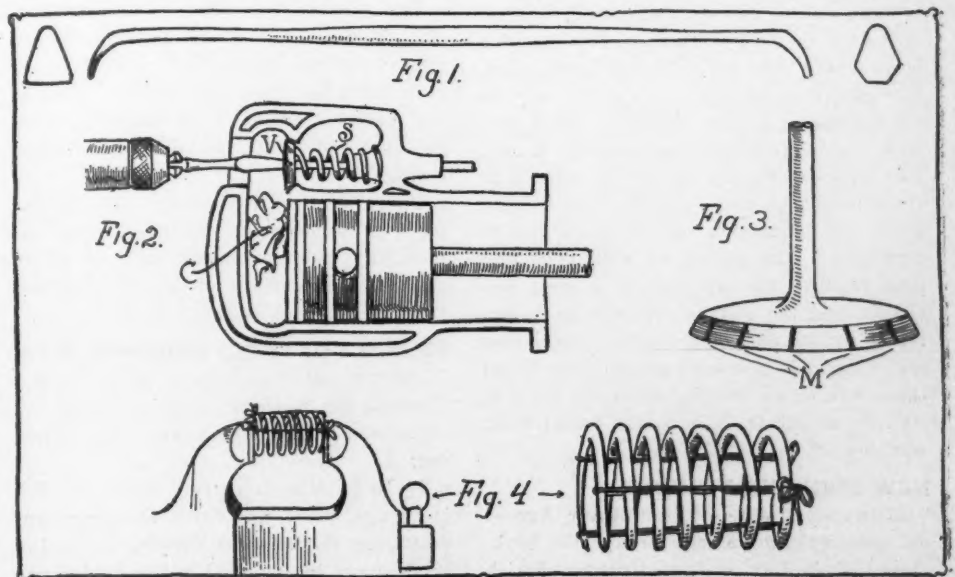
HIGH-TENSION MAGNETOS

Leominster, Mass.—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following questions?

- 1—What is the difference in high and low compression in gasoline engines?
- 2—How does a high-tension magneto differ from a low-tension?
- 3—What is the average piston speed per minute of a motor under test?
- 4—Does the Overland motor make 1,500 revolutions per minute?
- 5—What is the voltage at the spark plug from a high-tension magneto, and what is the amperage at the spark plug?—A Subscriber.

1—There are some engines on the market which have a cold compression of not more than 40 pounds, and there are racing engines which have compressions of 125 pounds. The standard motor of today has a compression ranging from 65 to 75 pounds.

2—The difference between a high-tension and a low-tension magneto is that the low-tension has but relatively few turns of fairly coarse wire on its armature, whereas the high-tension has a double armature winding, consisting first of relatively few turns of coarse wire and a great many turns of a very fine wire. The low-tension magneto generates a low-tension current, and must have in conjunction with it a coil which is carried on the dash and in which coil the voltage is raised so as to be strong enough to bridge the gap in the spark plugs. You always can be certain that when a coil is needed in conjunction with the magneto the magneto is a low-tension type. In the high-tension magneto there are only five wires—four to the plugs



SUBSCRIBER'S TOOLS AND METHODS EMPLOYED IN OVERHAULING LITTLE MAXWELL CAR

and one to the switch—whereas in the low-tension type there is the primary wire to the coil, a secondary wire from the coil to the magneto distributor, and the four secondary wires from the magneto to the spark plugs.

3—When manufacturers are testing motors the piston speed runs from 1,000 to 1,500 feet per minute. Motor Age representatives have seen tests where the piston speed approached 1,800 feet per minute for a brief time.

4—The average running speed of the Overland motor in touring work would probably be 800 to 1,200 revolutions per minute, although it would be capable of 1,500 or more if needed.

5—The voltage from a high-tension magneto at the spark plugs ranges from 12,000 to 25,000 volts.

EXPLOSIONS IN MUFFLERS

Fairmont, Minn.—Editor Motor Age—Through the Readers' Clearing House will Motor Age tell me what is the trouble with my Maxwell runabout which makes at times a spitting sound in the muffler, and when this noise is occurring the engine seems to lose power? This runabout is equipped with a Splittorf magneto with non-vibrating coil. The carbureter seems to be set all right as there is no firing through it and the engine runs nicely except when this spitting sound occurs. Is there any way by which the rear wheels of a car can be securely fastened to the straight type of spindles. The holes for the spindle ends in the wheels are straight, not tapered. Mine came loose from elongation.—New Subscriber.

The spitting sound in the muffler is caused by the explosion of gases therein which have passed through the cylinders of the motor without exploding. If a charge of gas is taken into a cylinder of a motor, and there is no spark to ignite it, it will be forced out into the exhaust pipe and muffler where it will be ignited by the flame of the following charge fired in the other cylinder. Your engine, therefore, is missing on one cylinder, or, perhaps, intermittently on both cylinders. The trouble is probably due to a faulty spark plug. The plug may be dirty; the points may be too far apart, $\frac{1}{8}$ inch is plenty; there may be a loose connection at the magneto or coil. The way to securely fasten the wheels to the straight type of spindles is to fit new keys, and then ream out the holes and fit new pins. The fitting of new keys and pins requires the services of a good mechanic, and the work should not be undertaken by an unskilled amateur or junior repairman. If the keys are properly fitted there will be no driving strain on the pin, its sole object is to keep the wheel from working off.

NEW ENGLAND TOURING

Milwaukee, Wis.—Editor Motor Age—I am contemplating a trip through the Berkshire hills in July or August next and wish Motor Age would answer the following

questions through the Readers' Clearing House:

1—My car, a seven-passenger, will be shipped to that vicinity, and I desire to ship it to some city where the facilities for unloading, etc., could be well taken care of. What point would Motor Age suggest?

2—What would be the cost approximately of shipping it to the point you name from this city?

3—From that point what route would Motor Age suggest, say for a touring trip of from 10 to 15 days?

4—From what city would the car be shipped back?

5—Is a license required in the section for the trip?

6—If possible refer me to a map publisher of that section.

7—What are the road conditions in that section of the country during that season?

8—What hotels would Motor Age recommend?—Subscriber.

1—Motor Age would suggest that you ship your car to Pittsfield, Mass., which is in the center of the Berkshire hills.

2—The cost of shipping would come to about \$80 by express, and around \$50 by freight. Would refer you to the freight agent in Milwaukee for exact information in regard to shipping rates.

3—The New England Hotel Men's Tour has been recommended. A map of this tour appears in the New England Blue Book.

4—The car could be shipped back from New York, Albany or Boston, or from Pittsfield if a round trip is undertaken.

5—Non-residents are exempt from registration and license requirements for 10 days if own state number is displayed.

6—Motor Age refers you to the Pilot Road Maps published by the Automobile Blue Book Publishing Co.

7—The road conditions in this section are fine, the roads being paved with gravel and macadam throughout.

8—All the hotels listed in the Blue Book are recommended.

PARTS IN SIX-CYLINDER MOTOR

Los Angeles, Cal.—Editor Motor Age—Will Motor Age tell me the approximate number of moving parts in a modern six-cylinder motor car? The motor, including fan, ignition system with magneto, transmission and shaft to rear axle?—Subscriber.

There are approximately 570 moving parts in a modern six-cylinder motor car, including the number of balls or rollers used in the bearings of the gearset, rear axle, wheels and steering knuckles.

SELDEN CONTROLS FRICTION SETS

Detroit, Mich.—Editor Motor Age—Through the Readers' Clearing House columns will Motor Age answer the following:

1—In friction drive cars where the disk is brought back and forth to engage and disengage the friction wheels, would this kind of car be included in the Selden patent?

2—Since the Selden patent includes only those cars where a clutch is used, would this be called a clutch?—Karl A. Kendrick.

1—Motor Age knows of no type of motor car now in use which derives its power from an internal combustion motor that is not covered by the Selden patent. The patent does not specify the type of clutch or means of connection between the running gear and engine; it covers anything that might be called an intermediate clutch or disconnecting device. The Buckeye Mfg. Co., Anderson, Ind., is a member of the A. L. A. M. and uses a friction scheme of the kind described.

2—The separating of the friction disks is the declutching feature in these cars.

SUITABLE GEAR RATIOS

Evansville, Ind.—Editor Motor Age—Kindly advise me through the Readers' Clearing House columns as to the correct gear ratio for a car of the following specifications, which I am assembling: Two-passenger roadster; weight, 1,800 pounds; four cylinders, 4 by 4; Rutenber motor, 25 horsepower; three speeds forward and one reverse; sliding gear transmission; floating axle with roller bearings, and 34 by 3½ tires.—Subscriber.

For all-around service, a gear ratio of three-and-one-half-to-one on high, five-and-one-quarter-to-one on second, eleven-and-three-quarters-to-one on low, and fifteen-to-one on reverse, would most probably give the most satisfactory service. However, if the car is to be used in a flat country, where good roads prevail, more speed and perhaps better service could be obtained from the following: three-to-one on high, four-and-one-half-to-one on second, ten-to-one on low, and thirteen-to-one on reverse.

ONE-CYLINDER TROUBLES

Cedar Rapids, Ia.—Editor Motor Age—I am running a little old-fashioned single-cylinder Rambler runabout which does excellent work. Once started she goes and keeps going till stopped, and navigates in pretty good shape. However, I have considerable trouble with flooding. I have a Schebler carbureter. For instance after running, if I stop and leave the machine for a few moments, when I begin to start the cylinder is flooded and I have an awful job blowing out the cylinder before it will start. I had a repairman work on the float thinking it might be too high, but that does not seem to have done any good. Can Motor Age suggest a remedy? Would a change of carbureters, such as the Holley, help matters? The cylinder is horizontal, and the gasoline seems to syphon in after it has stopped running. I would greatly appreciate your views on this.—D. H. Livingston.

When a Schebler carbureter is properly adjusted it is not more likely to flood than any other type of carbureter. Your carbureter floods because either the valve admitting gasoline to the float-chamber is prevented from seating properly, or the float-level in the float-chamber is set too high. Either of these troubles will cause the gaso-

line to run continually from the spraying nozzle, and owing to the position of the carbureter relative to the motor the gasoline simply drains down into the cylinder. If this trouble has always been a characteristic of your carbureter, the cause most probably lies in the float adjustment; and if it has developed since you have been running the car, it is more probable that there is a little dirt on the valve seat, or that the shellac on the float has been cut and the float become soaked with gasoline, making it heavier and thereby failing to close the valve tightly at the proper level. Motor Age would advise that you return the carbureter to the Schebler factory with a letter stating the nature of your trouble. They will make all adjustments free of charge and you are assured of its receiving expert attention.

FORD LIGHTING SYSTEM

South Bend, Ind.—Editor Motor Age—I have noted that several Ford cars in this vicinity have been fitted with an electric light attachment that seems to give a bright light and entire satisfaction. The light is generated by the magneto, however, and there is a slight question in my mind as to whether, in time, the magneto would not become demagnetized. If this be the case, could the magneto be remagnetized and at what probable cost?—G. G. E.

The magnets of a magneto generator are not readily demagnetized unless subject to improper treatment by curious and incompetent owners, drivers and repairmen, or to intense heat. The re-magnetization of a magnet is a very simple operation in the hands of an experienced workman, and any reputable manufacturer will gladly re-magnetize the magnets of his product free of charge. A device of this nature is being used on many Ford cars, but Motor Age cannot describe it at present but expects to in an early issue. The expert electrician at the Ford Motor Co.'s factory is authority for the statement that the magneto is not injured by the lighting system.

HAS GLIDDEN ASPIRATIONS

Little Rock, Ark.—Editor Motor Age—Will Motor Age through the Readers' Clearing House answer the following questions?

1—How shall I proceed to get a position to drive in the Glidden tour this year?

2—I have a six-cylinder 60-horsepower car fitted with a Bosch magneto, and some time ago it was overhauled, but since then has given no speed at all. It seems to pull fine at a low rate of speed, but at about 25 miles per hour the motor begins to knock and slow down. What shall I do to remedy this?—A Subscriber.

1—If you are an experienced driver you should communicate with makers whom you think will enter, and tell them of your desires. If your ability as a driver is known you may not have much difficulty in securing a position, but if you are an unknown quantity in the driving field, you

had better first engage with some maker, learn his car, and how to drive it, and then make your desires known.

2—Your trouble, apparently, is due to faulty timing of the magneto. It is possible that in reassembling the car the magneto gear was meshed up a tooth or so ahead of where it should be. It is also possible that your valve timing may be out a trifle for the same reason. One of the camshaft gears may be improperly meshed.

HOME-MADE GASOLINE TANKS

Cedar Rapids, Ia.—Editor Motor Age—Through the Readers' Clearing House will Motor Age tell me in detail how I can construct a home-made gasoline tank? What is the correct pressure of a 36 by 4-inch tire?—J. Lewis.

There are numerous ways of constructing a home-made gasoline tank, and in order to go into detail it will be necessary to know the purpose for which the tank is to be used and where you desire to put it. If you simply want a gasoline storage tank and do not wish to go to the expense of buying one of the more convenient tanks now on the market and specially designed for the purpose, you might secure an old second-hand water tank, the kind often seen in the kitchen of the household; have a plumber close up all the holes but one on the side; have this hole enlarged and a 2 or 3-inch pipe 2 or 3 feet long attached to it, paint the whole outfit with some good anti-rust paint, then bury it in the ground in some convenient place, either just outside or under the floor of the garage, allowing the end of the pipe to extend about a foot above the ground or floor. You may use a plain threaded cap to close the end of the pipe or a hinged cap with provisions for locking. Then secure a portable suction pump that will reach down through the pipe to the bottom of the tank for the purpose of drawing out the gasoline when desired.

In order to ascertain the correct pressure for a tire, it is necessary that you should know the weight of your car, or rather the weight each wheel must carry. One-half of a car is usually heavier than the other; therefore, to obtain the exact weight per wheel it is necessary to use a platform scale, any scale that has a platform sufficiently large to take the entire weight of the car. You must know the weight of your car when it is loaded with all tackle and accessories, water and gasoline tanks filled, luggage and all seats occupied. First weigh the whole car. Next weigh the back half of the car, then the front half; to do this the middle of the running boards should be over the edge of the platform. If carefully done the weights of the two halves when added together should be within 20 pounds of the total weight of the car. One-half the weight of the heavier half of your car is the weight per tire.

The Goodrich company advises that a

4-inch tire carrying 500 pounds should be inflated to 65 pounds to the square inch, 600 pounds load 75 pounds pressure, 700 pounds load 85 pounds pressure, 800—95, 900—105, and for loads above 900 pounds a larger tire should be fitted. The Michelin company advises a pressure of 75 pounds for all their 36 by 4-inch tires having a load to carry which ranges between 950 and 1,100 pounds. There are many motorists who claim that the best service is obtained from a tire when it is just inflated enough to make it stand up full and round under load. The proper degree of inflation for any make of tire may be readily obtained from its manufacturer.

CAUSES OF MOTOR KNOCKS

Pittsburg, Pa.—Editor Motor Age—I have a two-cylinder, four-cycle opposed motor in my car which is giving me some trouble. There is a continuous knock, or a dull heavy pound, from the moment the motor is started until it stops, and the further advanced the spark the more noticeable the pound. By holding either the exhaust or intake valve, or opening the petcock to relieve the compression, there is no knock. This trouble occurs at the end of the compression stroke. I have had experts take the cylinders off, but no one seems to be able to discover any cause for the knock. Any suggestions from Motor Age will be appreciated.—E. E. Hayes.

You state that, by holding either the exhaust or intake valve, the knocking ceases; also that the trouble occurs at the end of the compression stroke. Motor Age knows of causes of knocking in motors, but a knock that can be eliminated by simply holding the valves or opening a compression cock is rather an uncommon one. It is possible that preignition is the cause of your trouble; and by holding the valves open, or opening a relief cock so that the compression is reduced, the mixture is rendered so slow burning that it does not explode until the piston has started on its downward stroke. It also is possible that the bolts which secure the motor to the frame have become worn or loose and cause a knock at each explosion; and by opening a relief cock or holding the valves the explosions are weakened or the motor steadied so that the knock is eliminated. Motor Age advises that you examine these bolts and see that they are tight; then see that the ignition spark when fully retarded occurs just as the piston starts down on the explosion stroke. It also would be well to examine the revolving segment of the commutator to see that it is not loose on its shaft. Loose crankshaft or connecting-rod bearings or loose flywheels also cause knocks, but they are not eliminated by holding the valves. If you had given the name of your motor, and been a little more explicit as to how the valves were held, your trouble might be more readily solved. Motor Age would like information from any of its readers who may have a more plausible answer.

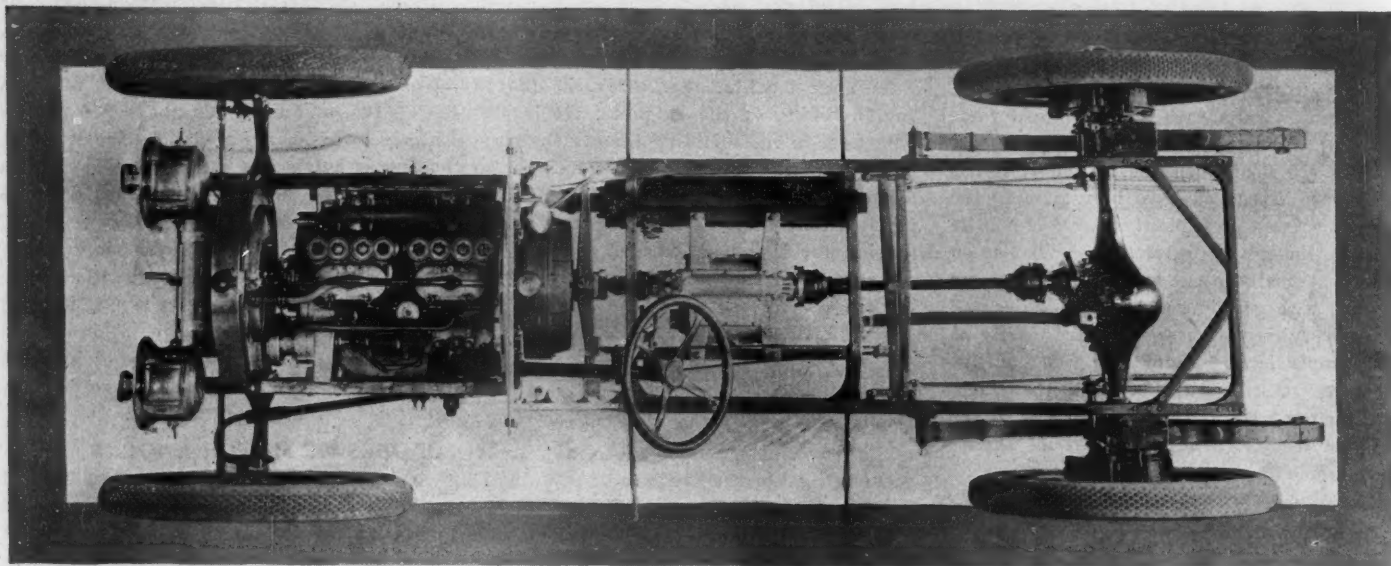


FIG. 1—OWEN CHASSIS WITH LEFT-HAND STEERING CONTROL

OF the unprecedented crop of new motor organizations in Detroit, Mich., the majority of them have brought out cars of the low and medium-priced type and it remained for the Owen Motor Car Co. to produce a high-priced car, which it presented to the public first during the Coliseum show at Chicago last February. This Owen car, as well as the company, takes its name from Ralph Owen, who for years was associated with the Olds Motor Works, and now is general manager of the Owen Motor Car Co. The Owen car is not an assembled proposition excepting in that Timken front and rear axles are made use of, but the motor, gearset, steering gear, and clutch are manufactured at the company's Detroit plant. It is a four-cylinder design, using 42-inch wheels and having left-hand control.

The Owen car is an up-to-date embodiment of the present trends of car construction in that it uses a long-stroke motor, the bore being $4\frac{3}{4}$ inches, and the stroke 6 inches, which measurements afford a considerable contrast as compared with cars in which the bore and stroke are the same. The motor is intended to run at from 700 to 1,000 revolutions per minute.

Fig. 1 shows the general layout of the Owen chassis. The motor with cylinders cast in pairs has the intake and exhaust valves on the right side, on which side the carburetor is carried, leaving the magneto on the left side. An inverted leather-faced cone clutch is used, back of which comes a double joint before the selective gearset is reached. Drive to the rear axle is through a propeller shaft with double universal joints, there being the customary torsion rod paralleling it. The propelling force of the rear axles is transmitted to the frame through three-quarter elliptic springs, a construction which does away with radius rods. In Figs. 2 and 4 the details of the motor appear, Fig. 2 showing one feature of construction, namely, the location of the water pump WP and the

The Four-Cylinder Owen Motor Car

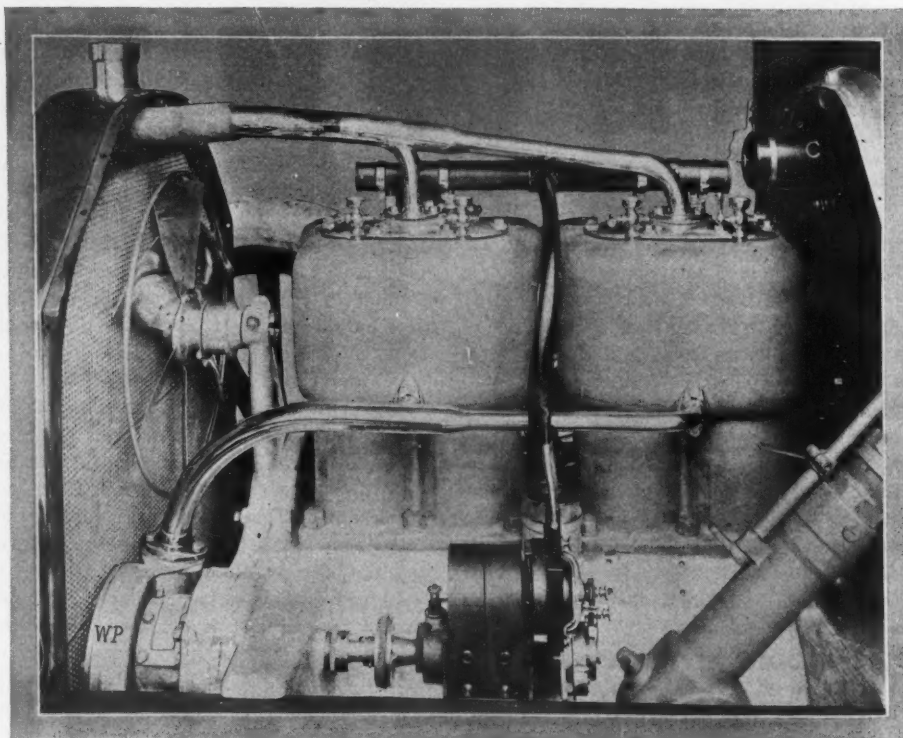


FIG. 2—MAGNETO SIDE WITH STEERING GEAR LOCATION

magneto, both driven through the same shaft but with the water pump located in front of the motor support and the magneto in the rear, the magneto resting on an integral plate filling the space between the motor support arms, the crankcase and the frame. In that part of the shaft extending backwards to drive the magneto is a coupling which allows of dismounting the magneto, and a jaw coupling is fitted to permit of removing the water pump.

Right Side of Motor

The details of the right side of the motor appear in Fig. 4, one of the characteristics being the employment of telescopic covers for the eight valve springs.

Each cover consists of two portions, an upper part U which completely incloses the valve spring, and a lower sleeve V of larger diameter which can be raised so the removal of the valve spring is possible.

There are many constructive details of interest in connection with this motor. The crankcase is an aluminum casting with an integral portion forming a timing gear housing at the forward end. Formed in conjunction with the crankcase is an oil reservoir for the circulating system, in which the oil is raised by gear pump through a pipe L which enters the crankcase just back of the carburetor and where it delivers its oil to a pipe within

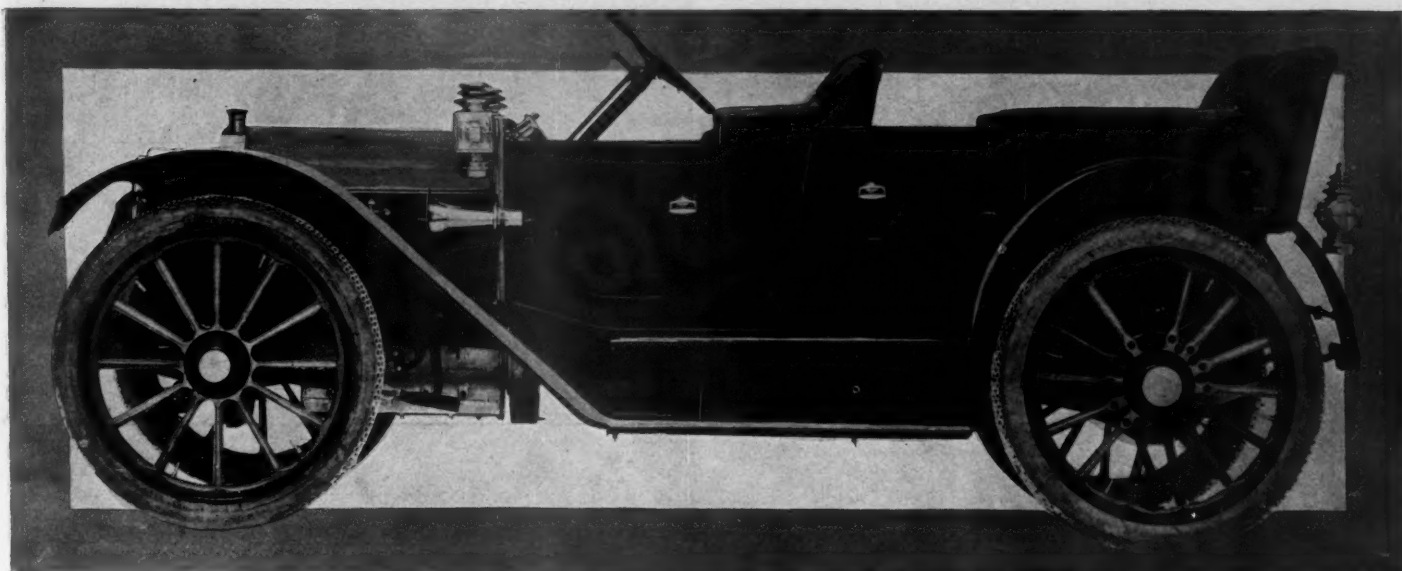


FIG. 3—THE OWEN CAR REGULARLY FITTED WITH A TORPEDO BODY

A New 1910 Detroit-Made Product

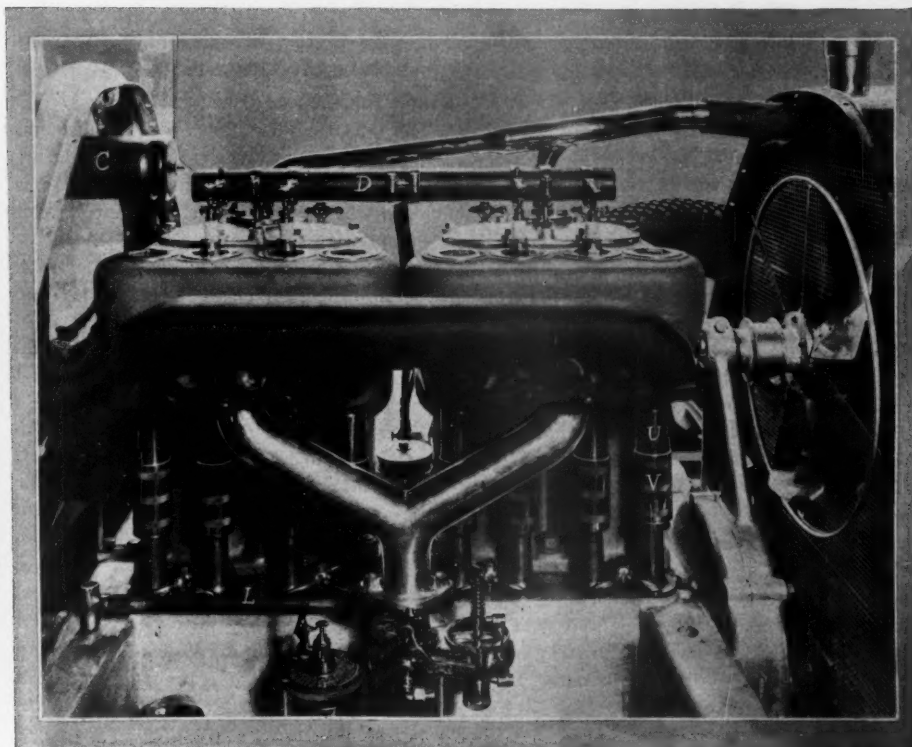


FIG. 4—VALVE SIDE SHOWING SPRING COVERS

the crankcase, this pipe having delivery advances to each of the four cylinders, so the pump sprays oil into the mouth of the cylinder and against the cylinder walls. There is a union at the rear end of the pipe L to which a pipe attaches leading to an oil pressure gauge on the dash so that the driver is always assured of the proper oil pressure that is used. The oil is used and reused several times, being filtered on each circuit.

Motor Has 6-inch Stroke

The use of a 6-inch stroke in a motor of this type has resulted in the employment of specially long pistons, which also are characterized by their light weight. These

pistons are 9 inches long and carry but three rings at the upper end, each ring being $\frac{1}{8}$ inch wide and of the lap-joint eccentric type. Not alone are the pistons of special length but the connecting rods are particularly long and each lower connecting rod cap is held in place by four bolts instead of two as is customary on many cars. The crankshaft is the conventional three-bearing design carried on Parsons white bronze bearings. Intake and exhaust valves are made 2 inches in diameter with bevel seats. Chrome nickel steel is the metal employed in them. The camshaft is entirely inclosed within the crankcase and is formed with separate

cams which are keyed against rotation with spacers for proper position. In the manufacture of this motor the usual grinding process is carried out in the cylinders, shaft bearings, etc.

The ignition system is a Bosch dual type with one set of plugs as shown in Fig. 4, mounted over the intake valves. On the dash is carried the non-vibrating coil C which is used for the battery current. Over the cylinders is a hard rubber tubing D which carries the high-tension leads to the plugs. Hinged switches are used between brackets on this tubing and the four spark plugs, these switches being hinged blades carrying a ball which fits in a stirrup at the top of each spark plug, the arms of the stirrup being hollowed to form a socket for the ball. Carburation is standard and cooling, includes a Mayo cellular radiator and belt-driven fan, provided with an eccentric adjustment for the belt.

It is not, however, with the motor and its appurtenances that all of the interest in this Owen exists; rather the transmission system deserves merit. In Fig. 5 is shown the selective gearset supported on a pair of wooden frame members, each 4 inches deep and $1\frac{1}{2}$ inch wide, these members being supported on the channel lips of raised cross members of the frame, as illustrated. The purpose in using wood supports is that noise is eliminated to a very great extent. This same principle of interposing wood is used in the motor where the motor arms attach to the side members of the frame. The gearset, operated selectively, is of that conventional horizontal design, the main and countershaft being located side by side and both carried on plain bearings. Chrome nickel steel is the material used in both shafts and also in the gears.

A feature of this gearset is that the lever L, Fig. 6, operating it is located in the middle of the footboards, so that left-hand control is provided on the car, but

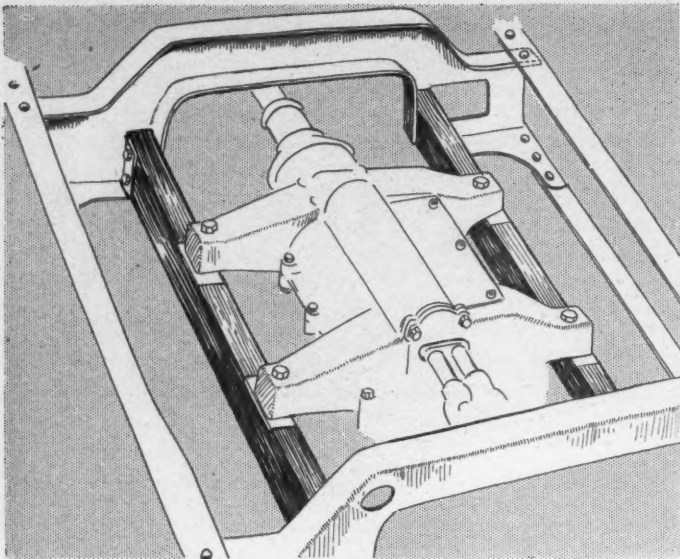


FIG. 5—OWEN GEARSET CARRIED ON WOOD FRAME

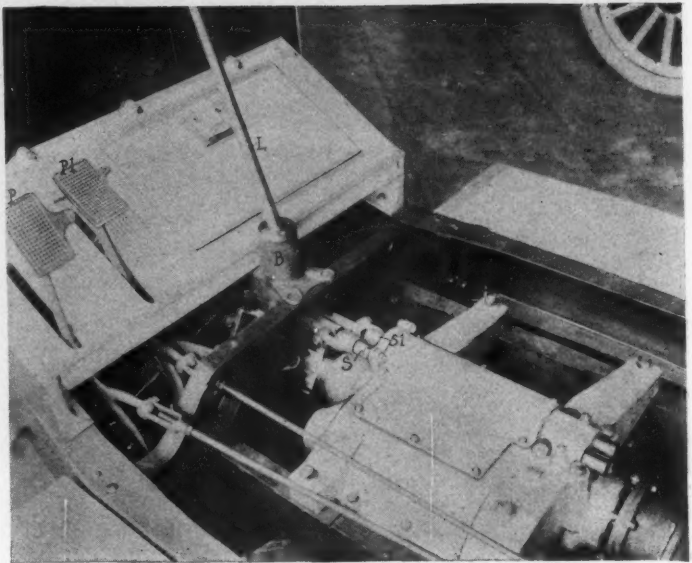


FIG. 6—GEARSHAFT LEVER L ON OWEN CAR

the driver controls the gear shifts with his right hand. This lever is a straight rod with a ball on its upper end to furnish an easy hand hold. The lever finds support in a bracket B, mounted on a cross member of the frame, and at this point there is a ball on the lever L forming a ball-and-socket joint in this bracket. Beneath the ball the lever L projects so as to engage in side slots on the two shifter rods S and S1 which enter the gearbox and control the sliding gears. Although this change-speed lever is without the usual H quadrant it operates the same, in that it may be rocked to the left or to the right. When rocked to the left, or towards the driver and pushed ahead, second speed is engaged, and when pulled to the rear high speed is engaged. Rocking the lever L to the right, or from the driver and pushing forward and back, gives low and reverse positions respectively. This location and design of the gear shift mechanism is a sound engineering point in conjunction with this car and one which simplifies construction to a remarkable extent. It is a design that will doubtless be imitated by not a few makers during the coming season. It makes possible that left-hand control which is so desirable for city use and leaves the one lever in the center of the car where it can be operated with the right hand.

Other Control Features

This design also permits of a very simple connection between the lever L and the shifter rods S and S1. Before departing from this phase of the car, the remaining control features might be cited, as they consist of two pedals P and P1. The pedal P controls the clutch and service brake, the initial movement of the pedal disengages the clutch and the further movement applies to brakes, which are of the contracting rear axle type. The role of the pedal P1 is solely that of controlling the expanding emergency brakes. In order that these brakes may be locked

in the on position, this pedal has a ratchet arrangement whereby pressure on the toe of the pedal locks it in any desired position, and pressure on the heel of it releases it. This renders brake operation very convenient.

The running gear of the Owen car is a stoutly-built construction employing Timken axles, the rear axle being a floating construction with the axle housing of pressed steel design. As in all Timken axles of this type short-series bearings are used for carrying the shafts and differential, and the braking system furnished is internal and external sets. The forward axle is an I-beam section well dropped between the jaw endings for the steering knuckles and the integral spring seatings. It is but moderately dropped between the spring seatings, leaving a clearance of 11 inches. In connection with these are 42-inch wheels. The frame is a heavy nickel steel design with a double drop, and a horizontal offset at the dash. The forward drop is just in rear of the dash and continues to in front of the back axle where it is raised over the axle, permitting the use of three-quarter elliptic springs. The horizontal offset at the dash is very slight and gradual. Front springs are semi-elliptics, 40 inches long and $2\frac{1}{4}$ inches wide, and the rear three-quarter elliptics

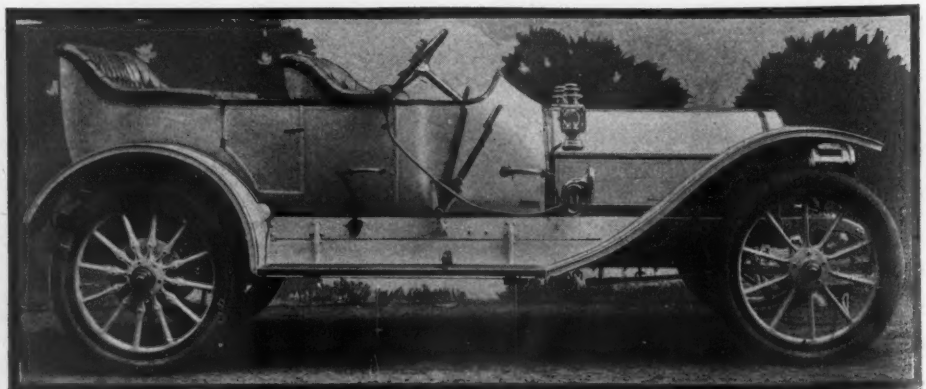
are 55 inches long. All springs carry bushings for the shackle bolts and grease cup lubrication is provided for each. The clearance at the rear axle is 13 inches and from the bottom of the crankcase to the ground measures $13\frac{1}{2}$ inches.

Other Features of Owen

The Owen car is turned out regularly as a five and seven-passenger torpedo touring car body as illustrated in Fig. 3. It is made with 120-inch wheelbase and wheels are shod with 42 by 4-inch tires. A factor in conjunction with this car is the complete lamp equipment consisting of combination electric-acetylene headlights, electric-oil side lights, and electric-oil tail lamp. An electric horn, windshield, and top are included equipment. The torpedo body is a consistent curve from front to rear with two doors at each side.

A novelty in this car equipment is the carrying of the acetylene gas tank transversely in front of the radiator from a tubular cross bar used for the purpose. This cross bar is supported at either end in a bracket which bolts to the frame and has a vertical portion forming a lamp bracket and a horizontal part forming a receptacle for the tubular cross piece referred to.

The brake system is carried entirely inside the frame side members, as shown



THE TORPEDO BODY ON THE MATHESON SIX CAR

in Fig. 8, one set operating through the transverse equalizer E and the other through the equalized E1. Instead of these equalizers working in slots in the side members of the frame, they slide in brackets carried above the frame members, thus eliminating the necessity of dulling the latter. A pair of leaf springs insure the immediate release of the equalizers.

In Fig. 7 appears a meritorious tool box novelty, in the form of a cast aluminum box, which forms a second step to the tonneau. There is one on each side, each having a hinged cover, which can be locked when shut.

MOTOR CAR LITERATURE

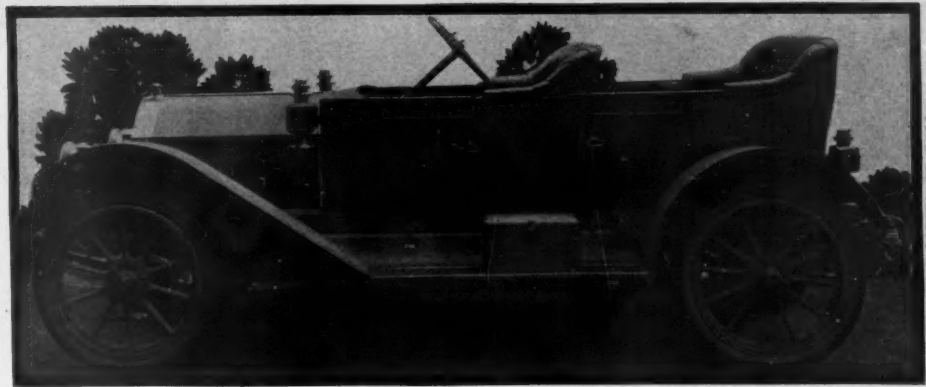
"How Proper Care Will Prolong the Life of a Stoddard-Dayton" is the name of a valuable instruction book issued by the Dayton Motor Car Co. The illustrations are perspective blue prints which go into detail on every one of the car parts. The book is throughout its seventy pages brim full of information on attention the cars should receive, the troubles that will be met with, and how to diagnose and correct them.

The Oakland Motor Car Co., in its 1910 catalog pictures and describes its Oakland models in a conventional manner. A full-page illustration shows some of the Oakland trophies won during the past season.

The 1910 Premier catalog has a novelty in the form of a double center page containing seven group photographs of Premier cars in different contests during the past season. The catalog itself illustrates the different details of Premier construction.

The Cartercar Co. has a 40 by 28-inch poster on its model L touring car which, in addition to the car photograph, contains complete set of specifications. It has a similar poster on its model H car.

The 1910 catalog of the Zimmerman



PIERCE-RACINE TORPEDO TYPE OF BODY

Mfg. Co., Auburn, Ind., illustrates and describes its five Zimmerman models.

Publication No. 387 from the National Brake and Electric Co., Milwaukee, Wis., deals with its type 3VS motor-driven air compressors.

From the H. W. Johns-Manville Co. has been received the February number of the "J.-M. Packing Expert," which continues its story on the subject of asbestos.

"The Powerful Grout" is the title of a catalog from the Grout Automobile Co., Orange, Mass., which describes in a conventional manner its touring, toy tonneau and roadster models.

Charles E. Miller, New York, has issued his annual catalog for 1910, which is a 255-page, 7½ by 9 size, and lists with prices all kinds of accessories pertinent to the motor car.

The Croxton-Keeton company, Massillon, O., has issued a catalog describing and picturing its French type of cars. Sixteen full-page illustrations of the various models of this concern are shown in the catalog, including the pleasure and commercial vehicles which this company markets.

The de Dion-Bouton cars, both pleasure and commercial types, are featured in a conventional catalog, 7 by 5 size. A general description of the de Dion-Bouton cars is given, and specifications of all models are included.

The Timken-Detroit Axle Co., Detroit, Mich., in its 1910-11 catalog describes its axles, hubs and bearings for the commercial car. Line drawings illustrate the Timken hub in detail.

Haberer & Co., Cincinnati, O., in its 1910 catalog features in a conventional manner its Cino car, which is one of the newcomers in the motor car field.

The Pittsburgh Motor Car Co., New Kensington, Pa., is mailing to the trade a folder containing two illustrations of the Pittsburgh car.

"The Live Map" is the title of an illustrated booklet describing the Jones live map, the invention of J. W. Jones, of speedometer fame, and which is being marketed by the United Manufacturers. Several attractive illustrations portray the field of this live map, which contains 500 routes throughout the country.

Three books from the Atlas Portland

Cement Co., New York, deal with the subject of concrete construction in its many phases. "Reinforced Concrete Factory Construction" treats of the material as adapted to various types of factory buildings, and typical examples of concrete factories are included together with detailed illustrations and measurements. The other two books take up the subject of concrete construction and its possibilities in connection with the home and farm, and in highway and bridge work.

"The World's Best" is the title of the house organ of the Gramm Motor Car Co., Bowling Green, O. This little magazine, which has just made its debut, will be issued monthly in the interests of the Gramm company.

"Bulletin No. 14" is the title of the latest catalog issued by the K-W Ignition Co., dealing with its various types of magnetos.

The Hewitt Motor Co., in a 6 by 9½ size catalog, gives a general description with illustrations of its 2, 3, 5 and 10-ton trucks.

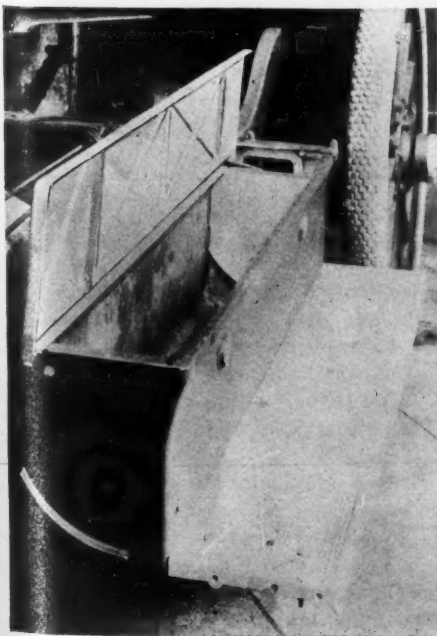


FIG. 7—OWEN SIDE TOOL BOXES

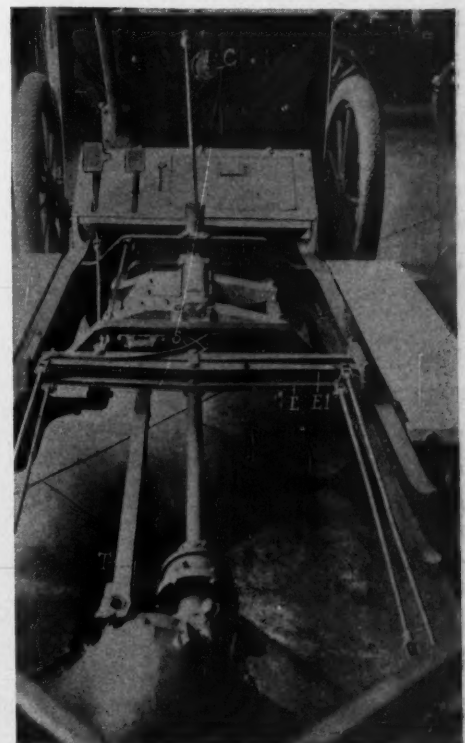


FIG. 8—OWEN BRAKE CONNECTIONS

WAR OF MIDGETS, THE INCH AND THE METER

MORE letters on the relative value of the inch and the meter as pertaining to factory operation have been received by Motor Age from the following concerns: **Dorris Motor Car Co.**

"We would prefer sticking to the English or American A. L. A. M. standards, which have been used up to date. We are using some of the same duplicate parts used on our cars since 1905, and any change will make future complications. We have had very satisfactory results with the present system, and which we would like to continue."—**Dorris Motor Car Co. G. P. Dorris.**

Grout Automobile Co.

"At the present time, from a manufacturer's standpoint, we are all mixed up and the sooner we get onto either one basis or the other the much better we all will be and the much cheaper the owner can maintain his motor car. We believe that the English system is superior for the average man to have on his car; he is familiar with it in every way, studies it at school, where, with the metric system every time a measurement is given he has to look into a book to see what it means, to have any idea as to its size. It is possible that at a future date we would all become so conversant with the metric system it would make no difference, but why change when there is nothing gained? It is just as easy to make a standard of the English system as it is of the metric. This is a personal opinion."—**Grout Automobile Co., W. J. Gould.**

Atlas Motor Car Co.

"As the English system is the one best known among the American workmen and also the one used almost exclusively by American manufacturers, in our opinion, for present day use, the English system would be preferable."—**Atlas Motor Car Co., H. A. Knox.**

Lexington Motor Car Co.

"With reference to the relative merits of the metric versus the English system of measurement we will say that we are using, with the exception of our spark plugs, the English system all the way through our car. Our reason for adopting this at the start was because of the fact that practically all garages, machine shops, and those which do any work at all on a motor car, have tools, and so on, of English measurement. We feel that the owner of our car, when it is necessary to have something done, would experience less trouble and get prompter service by adopting such measurement. It is not our intention, just now, to consider anything else."—**Lexington Motor Car Co., J. C. Moore.**

St. Louis Car Co.

"At the present stage of the motor car industry, we are in favor of using the United States standard of measurement.

(Continued from Last Week)

The metric system is the easier method of measuring, also calculating, but the factory problem is what has to be reckoned with in this case. In this country we cannot obtain stock for bolts, nuts, etc., in metric sizes, and as a result we would be obliged to make our own chucks and tools. There ought to be a standard established by motor car builders which, we think, would greatly help the trade."—**St. Louis Car Co., C. T. Schaefer.**

Babcock Electric Carriage Co.

"It would be very nice if the metric system could be adopted by all makers of motor cars, providing that other manufacturing industries would adopt this system. For instance, those makers who purchase parts from manufacturing concerns who use the English system, would hardly want to make special parts, such as differentials, gears, etc., unless the metric system were a standard in their factory. We do not believe that it would be possible to make a radical change in any given length of time, and think it would be necessary that the mixed system be used at the present time and that the metric system will be a gradual development of necessity."—**Babcock Electric Carriage Co., F. G. Peck.**

Colburn Automobile Co.

"I much prefer the metric system. We have been using it for some time on our cars with the utmost satisfaction. It is a much easier system from the designer's standpoint, and also minimizes chances of error in the shop. In fact, its merits are too many to take up in a letter. You may put us down as being absolutely in favor of the metric system."—**Colburn Automobile Co., H. C. Colburn.**

Abendroth & Root Mfg. Co.

"We are strongly in favor of using the metric system of measurements in place of the present inch-and-foot system. The new system could not be inaugurated any too soon to suit us, as it would not only prove a time-saver, but also prevents numerous mistakes and trouble."—**Abendroth & Root Mfg. Co., E. C. Welsh.**

Chalmers Motor Car Co.

"We would be very much in favor of the metric system over what is known as the English system. If steps could be taken toward adopting the metric system alone as standard, in view of the entire American car industry making use of it by the end of the second or third year from now, believe it would be feasible, and most satisfactory to all. Of course, a matter of this kind would take at least

two or three years to put through."—**Chalmers Motor Car Co., George W. Dunham.**

Rauch & Lang Carriage Co.

"In our opinion the metric system is nearly ideal. The expense in tools and fittings would not warrant us in making the change, however. We are using the mixed system with no appreciable trouble, because in those parts that are of foreign manufacture and come in metric sizes, the fit is so close that the unit of measurement is .0002 inch, and this is just as readily taken care of one way as another."—**Rauch & Lang Carriage Co., J. Huston.**

Velie Motor Vehicle Co.

"We are heartily in accord with any movement looking towards the adoption of the metric system of weights and measures. We realize, however, how serious an undertaking this will be and would suggest that in case of its adoption the date for commencing this system be set some years in advance, so as to allow manufacturers an opportunity to replace gauges and other material affected."—**Velie Motor Vehicle Co., L. M. Fuller.**

Welch Motor Car Co.

"There is no question in our minds as to the superiority of the metric system, and its ultimate adoption by American engineers. It is a change, however, that must take place gradually."—**Welch Motor Car Co., F. S. Welch.**

Metz Motor Car Co.

"We appreciate the fact that eventually the metric system of measurement must prevail, but we feel that the time is not ripe to make such a radical change, and await the opportunity when it can be accomplished with the least trouble and expense."—**C. H. Metz.**

Knox Automobile Co.

"We believe it would be a wonderful thing if the metric system of measurements could be used in this country, but we believe it would take a long time and an immense amount of money to do it. No doubt this change will have to be made some time, and perhaps the sooner it is adopted, the better. This, of course, would pertain only to measurements and weights. The writer does not believe there would be any object in changing the gear tooth measurements to the French system, as that would be an endless job, and we are confident that our gear system is equal to theirs."—**Knox Automobile Co., H. G. Farr.**

Baker Motor Vehicle Co.

"Our personal opinion is, that the metric measurement if adopted in general would be an advantage as compared with the English system."—**Baker Motor Vehicle Co., E. Gruenfeldt.**

Great Western Automobile Co.

"We are in favor of the continuance of the present system of using English



units in our factory. We cannot see the sense of changing to the metric system. The men working in shops are educated to the English system, and it would be a case of drilling them into something new and to no apparent advantage. The government sets the standard and we believe that it would not be advisable to have the motor car industry adopt the metric system in place of the English as used in other factories. We believe the principal argument in favor of the metric system is to conduct factories along the same lines as the French and we believe that instead of trying to follow the French methods the time has come that the French ought to follow American motor car manufacturers, as there is little doubt but that the American methods have surpassed French in motor car construction and factory standardization."—Great Western Automobile Co., E. Mack Morris.

Rider-Lewis Motor Car Co.

"We are very much in favor of the retention for the present of the English standard system of measurements in connection with bolts, nuts, threads, in fact all dimensions used in motor car manufacture. We take this stand for the reason that motor car manufacture has become standardized to a point where a change would mean a revolution in factory methods that would sweep away a foundation of many years' standing. And while we recognize the advantages of the metric system, we desire to place ourselves on record as favoring a very gradual adoption of it under a supervision of technical committees of the manufacturers' association."—Rider-Lewis Motor Car Co., Ralph C. Lewis.

Midland Motor Co.

"The metric system of measurements does not interest us, as the time it would take to educate our workmen and the additional time which would be required in the office to compute all our measurements from one system into the other would, in our opinion, be a great nuisance as well as very expensive."—Midland Motor Co., C. H. Pope.

Elkhart Motor Car Co.

"We do not prefer the metric system, never did, and never will. We prefer the English or American system of measurements, and our reason for this is, that our mechanics have been accustomed to such system for long years and are well acquainted with it. To attempt to further introduce the metric system into American shops means more confusion and eventually, failure. A prolonged attempt has been made to force the metric system upon American manufacturers, and as a result they are today publishing English measurements in one column and metric measurements in another, and for long years this would be necessary, owing to the fact that the average mechanic in America is satisfied with the present system and has no time to acquaint himself



with anything foreign, and so it is absolutely useless. Much has been said about the convenience of the metric system, but, in our opinion, the convenience of any system depends on our personal acquaintance with that system."—Elkhart Motor Car Co., H. J. Wells.

Royal Tourist Car Co.

"Regarding the adoption of the metric system for motor car construction, there is no doubt that the metric system is far more convenient than the one we now use, but we think that its superiority over the present system is more marked in volume, distance and weight than in such measurements as we use in motor car parts. In fact, we can see no great advantage in the use of the metric system in motor car parts, and we do not believe it would be wise for motor car manufacturers to take up the metric system unless in common with the other branches of business in this country. We certainly can see no advantage in using what is called the mixed system, using the metric measurements for some parts and the English for other."—Royal Tourist Car Co., F. C. Moch.

Moon Motor Car Co.

"As a majority of our workmen are Germans, we would have little difficulty in organizing the factory upon the metric system. However, all the trades people in die parts, every pattern maker, foundry man, etc., and so on, are accustomed only to the English system, and it would cause such an endless confusion, we would be strenuously against the adoption of the metric system. We believe there is no necessity for anything but the English throughout on cars, at least until the metric system is officially adopted by the United States government. On our car we use the metric system on our spark plugs only, and there is really no occasion for this at this date."—Moon Motor Car Co., S. McDonald.

Gaeth Automobile Co.

"We believe, in brief, that there are numerous advantages in the metric system, chief of which are simplicity in mechanical complications and the fact that were this system adopted small parts upon American or foreign machines would be to a very great extent interchangeable. As far as actual serviceability goes, we see no particular reason why one system should be more favored than the other. About the only argument which we can

see against the metric system is the fact that a new system of standards would necessarily have to be adopted, in fact, all tools which American manufacturers now have would either have to be discarded or reconstructed, provided the change were made. This, we believe, is about the only phase of the question which prevents universal adoption of the metric system, and we think most manufacturers agree that were it not for this necessary change they would adopt this system."—Gaeth Automobile Co.

Inter-States Automobile Co.

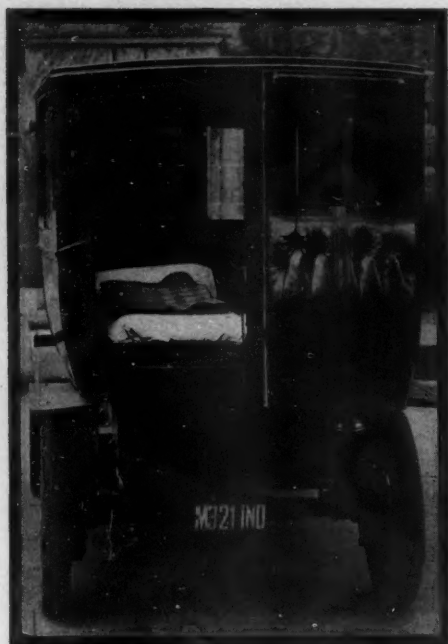
"I believe the metric system would be much better than the English on account of the increased use of micrometers for all ordinary machine shop works and the readings being necessarily in hundredths and thousandths of an inch. This is confusing to the average mechanic, as he must needs figure how much a 64th of a 32nd is, in order to get a comparison, and I do not think it would be much harder for him to accustom himself to the metric system. The only difficulty would be in getting enough of the car makers and parts makers to adopt it, to make it a standard. I would, therefore, be in favor of adopting the metric system in preference to the present system, and I am not in favor of the continuing of the two systems, such as you will find at the present in some factories."—Inter-State Automobile Co., Claude E. Cox.

Moline Automobile Co.

"We fully appreciate the merits of the decimal or metric system. We fail, however, to see how a change could be made at this time from the English to the metric system, due to the very advanced state of the manufacturing art in this country. We believe that this country made a grievous error in not adopting the decimal system a hundred or more years ago, before the manufacture of duplicate parts had become so firmly established here. We believe that at the present time a complete change is entirely out of the question and that a partial change would only lead to endless confusion. When we take into consideration the vast amount of money that is invested in this country in machinery, special tools, jigs, standard gauges, etc., all worked out in the English system, we can readily imagine the difficulty we would be up against in an effort to change our factories over to the metric system. We therefore feel that the day when a change of this kind was possible in this country has long since passed and that any effort in that direction at this time would fail."—Moline Automobile Co., W. H. Van Dervoort.

(To Be Continued.)

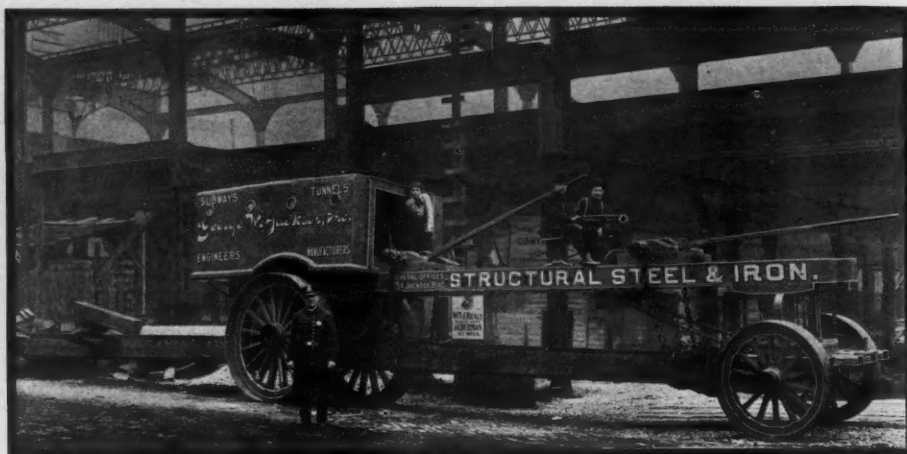




INTERIOR PREMIER LIMOUSINE AMBULANCE

NEW COMMERCIAL COMPANY

THE Clark Power Wagon Co., Lansing, Mich., is a new concern that is entering the commercial car field and has had its initial wagon on the market for several months. This concern is a reorganization of Clark & Co., Lansing, Mich., which has been established in the buggy business since 1865; and the Ferguson, Motor Co., of Lansing, which with its plant and equipment has entered into the new corporation known as the Clark Power Wagon Co., with capital stock of \$500,000. This company will build the Clark car, a 1,000-pound delivery wagon with a 20-horsepower two-cylinder motor, 5-inch bore and 5½-inch stroke. This motor is of the opposed design with the cylinders located transversely beneath the floor board. Its motor is fitted with thermo-syphon cooling arrangements and double ignition system,



MOTOR TRUCK USED IN BRIDGE CONSTRUCTION WORK IN CHICAGO

In the Realm of the

one ignition set being a high-tension magneto, and the other a battery set. The transmission system begins with a cone clutch with cork inserts, and has a two-speed sliding gearset which is designed as a unit with the jackshaft, having side chains for final transfer of power to the rear wheels. The combined transmission and jackshaft are carried on a three-point suspension, and imported annular bearings are used in this part of the truck. Double contracting brakes are fitted on each rear wheel. The wheelbase measures 95 inches, the tread is 56 inches, and a three-quarter-elliptic spring suspension is used in front and a platform set in the rear. Forged axles are used and the truck is regularly equipped with 36 by 2½-inch solid or 36 by 3½-inch pneumatic tires.

The factory in which these trucks are made is located at Grand avenue and Washtenaw street, on a space 132 by 150 feet, giving an available floor area of

19,500 square feet. The company also owns property on River street, adjoining the factory, measuring 398 by 150 feet, which will be used in the near future. In addition to this a machine shop 75 by 200 feet and three stories high will add over 50,000 square feet of floor space. The present factory facilities are adequate for fifteen cars a day.

The personnel of the Clark Power company starts with Frank G. Clark, president, and who was connected with Clark & Co., in their buggy days. A. R. Radle, factory manager and secretary and treasurer, has been connected with the commercial end with the Rapid and Grabowsky concerns, and also managed the Indianapolis Motor Car Co. John Demmler, engineer, has been connected with the Packard company for the past 3 or 4 years in a designing capacity. H. B. Warner has been appointed general superintendent, he having been connected with the Sheffield Car Works, Three Rivers, Mich., for the past 6 years.

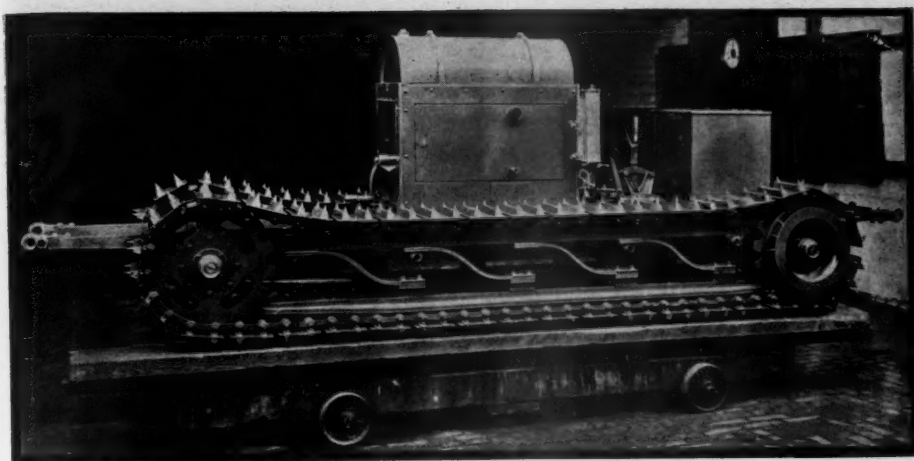
BRIDGE CONSTRUCTION TRUCK

A most unique motor truck of 20-ton capacity has been built for its own use by the George W. Jackson Co., Chicago, the vehicle being intended for work in the contracting field. The truck is intended to carry heavy girders and columns required in bridge construction or the steel framework of buildings. The steam engine is a two-cylinder type, 8-inch bore, 8-inch stroke, and intended to run at 225 revolutions per minute. It is located with the cab at the rear end of the truck. Steam is supplied by a marine type water-tube boiler 5 feet wide, 5 feet long, 4 feet 8 inches high, and containing 325 feet of heating surface, with 13 square feet of grate area. This motor is claimed to develop 60 horsepower.

The driving mechanism from the motor consists of a phosphor bronze pinion 10 inches in diameter with 5-inch space width



PREMIER LIMOUSINE AMBULANCE DESIGNED FOR HOSPITAL SERVICE



MOTOR SLEIGH THAT MAY BE USED IN ANTARCTIC WORK

Commercial Car

which meshes into a steel compensating gear $37\frac{1}{2}$ inches in diameter and mounted on a compensating shaft or differential $3\frac{1}{8}$ inch in diameter. The differential is of the bevel gear type. At the outer ends of the driveshaft are pinions 9 inches in diameter and 4-inch face, which mesh into internal gears riveted to the inner rims of the rear wheels, which are 6 feet 8 inches in diameter with tires 18 inches wide, the steel bands constituting the tires being $\frac{3}{4}$ inch thick. Sufficient clearance for backlash is provided between the driving pinions on the internal gears to permit of the wagon operating with one driving wheel 1 foot lower than the other without binding the gears. The rear axle is arched upward in the center.

The running gear is a stout construction, the wheelbase 26.5 feet in length and the truck 32 feet over all, with a maximum height of 11.5 feet and a total width of 8.5 feet. The frame sills are Douglas fir 32 feet long and 10 by 12 inches cross section. These sills are placed 6 feet 8 inches from the ground and the forward ends are supported by a heavy bolster which rests on a fifth wheel so that in turning the front axle swings as in a horse-drawn vehicle. The front wheels are 4 feet 6 inches in diameter and have steel tires 12 inches wide. Steering is along traction engine lines under the control of a hand wheel, the axle being turned by chains from the axles' ends.

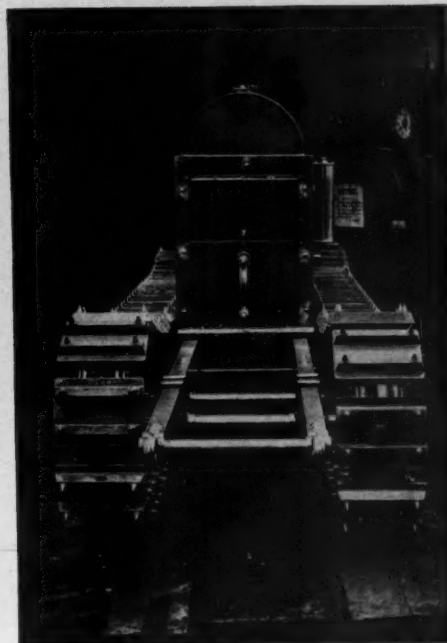
ANTARCTIC MOTOR SLEIGH

Captain Scott, who has been commissioned by the English government to make an effort to reach the south pole, has been experimenting lately with sleighs for this work. It will be remembered that Lieutenant Shackleton in his antarctic expedition when he reached within 100 miles of the south pole used a motor sleigh in his campaign. The sleigh illustrated for Captain Scott has been manufactured by the Wolsley Tool and Motor Car Co. This

sleigh might be described as a four-wheel car, but the wheels do not touch the ground. Instead of the wheels bearing on the ground an endless chain supports the car at each side, this chain passing over the front and rear wheels. The chain is fitted with studs for adhering to the ground surface, and the wheels might be described as coarse cog ones. The appearance of this sleigh in motion is peculiar in that the chain where it touches the ground appears to stand still, while the sleigh glides forward over it. The rear view shows the complete arrangement of the two endless chains. All of the motor mechanism is entirely inclosed and the gasoline tank located directly above it. Suitable packing has been fitted to afford the necessary protection against cold.

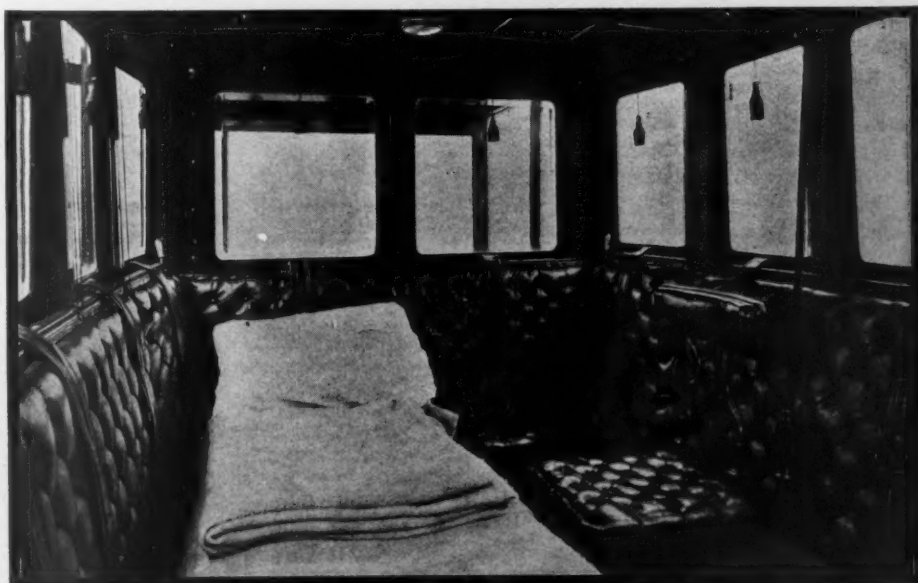
PREMIER MOTOR AMBULANCE

The Premier Motor Mfg. Co. has recently built for an Indianapolis company and for a California hospital a vehicle



REAR VIEW OF MOTOR SLEIGH

which might be designated a limousine-ambulance, this design being to remove that unpleasant suggestion which invariably accompanies the conventional ambulance. The body is built on a four-cylinder Premier chassis with 120-inch wheelbase. There is a regular side entrance at the right in rear of the driver's seat, and also one at the left. Ample lighting facilities are furnished and roller curtains fitted. As illustrated the rear door admits the stretcher, which is operated over a roller sill under the cushion of the rear seats and fits into steel grooves fastened into the front and rear of the body interior. The entire inside is upholstered in black leather and two folding chairs are provided. Additional seating capacity is furnished by half of the rear seat, when the stretcher is used, and the entire rear seat with the stretcher not in place.



COMFORTABLE INTERIOR OF PREMIER LIMOUSINE AMBULANCE



From the Four Winds



Premier's Glidden Drivers—Ray McNamara and George Weidely will drive the Premiers in the Glidden tour.

Politicians Buying Cars—During the last few weeks every official of the Wisconsin state government at Madison, Wis., has purchased a motor car, presumably for campaign purposes.

Car for Archbishop—The Most Rev. S. G. Messmer, archbishop of the Milwaukee diocese of the Roman Catholic church, was the recipient of a welcome gift last week from an anonymous donor. The gift was a seven-passenger touring car.

Will Banquet Gliddenites—The Oklahoma Association is planning to receive the Glidden tourists on their arrival at Oklahoma City presumably June 26. A banquet will be tendered the tourists and other features not yet fully decided on will be carried out.

Cole Will Race Some More—Inspired by the success of the Cole 30 at the Los Angeles races the manufacturers of the car have arranged for the entering of two Cole cars at the Atlanta events, and it is proposed to have two cars in the coming Glidden tour.

Firemen Building Fire Engine—Having purchased an Olds chassis the firemen at No. 3 engine house at Grand Rapids, Mich., are busily engaged in the building of a motor fire engine which will be a combination chemical, hose wagon and truck. The firemen have a little shop of their own and it is said that their work on the new engine will save the city about \$1,000.

Kansas City's Climb—Entry blanks have been published for the annual hill-climb of the Automobile Club of Kansas City on Dodson hill April 30. The event is under the sanction of the American Automobile Association, which has nominated W. P. M. Stevens, secretary of the club, as official representative. The county engineer is at work on the hill resurfacing bad places, building banks on the turns, and reflooring a small bridge about midway in the hill.

Police Instruct Drivers—Instructions to chauffeurs recently issued by Superintendent of Police Regan of Buffalo include the following points: "Always obey the orders of the police officer. If you consider him in the wrong, don't argue; obey, and report facts to me. It will be investigated and justice done. A vehicle overtaking another shall pass on the left of the overtaken vehicle and shall not pull to the right until at least 5 yards clear of the vehicle passed. Vehicles will not be permitted to turn in the center of the block nor cross from one side to the other side of the street within blocks, but may cross



JOE TRACY'S WIND AND RAIN SHIELD

at the end of the blocks and inside the crosswalks. Vehicles will not be permitted to stand two or more abreast in any of the roadways."

Climb Billed at Paris, Ill.—Dealers at Paris, Ill., are preparing to hold a hill-climbing contest either the first or second week in May. Silver loving cups will be awarded the winners of each class.

German Small-Car Test—Thirteen German concerns have each entered three cars in the German small-car trials to be held next month. Much interest will surely center upon three Mercedes entered which it is said are of new design and will make their public debut on this occasion.

Balks Over Bad Roads—The Columbus Automobile Club, of Columbus, O., after deliberations lasting several weeks, has turned down the proposition to establish a country home at Buckeye lake, a summer resort east of Columbus, because of the bad roads over which it would be necessary to travel to reach the club house. The committee in charge of the affairs is casting about for another location which will be suitable to the membership of the club.

You Ought to See It Now—The La Crosse Automobile Association, of La Crosse county, Wisconsin, one of the most important branches of the Wisconsin State Automobile Association, is preparing for an especially active season in the way of tours, hill-climbs, reliabilities and sociabilities. La Crosse was one of the night controls on the 1909 Glidden route, and at that time there was much complaint over poor roads, this territory being probably the worst of the entire tour, and the most exacting. Much has been done since that time by members of the club and by the

county board and city council to remedy matters, and more will be accomplished this season.

Louisville Will Hold Meet—The Louisville Automobile Club has signed a contract for several days of racing to be held during July. The details have not yet been arranged, but Douglas Park track probably will be secured.

Big Number for Mayor—Mayor Julius Fleishman, of Cincinnati, received license tag No. 20,000 from the office of the state registrar last week. There were but 23,000 tags issued last year. Indications point to about 35,000 this year, showing a very liberal increase in the number of machines in use.

Flat Tire Club Run—The Flat Tire Club, a social branch of the Indianapolis Automobile Trade Association, gave its first Sunday run on April 17, going to the Half-Way house, 37 miles west of Indianapolis, on the national road. Each Sunday during the summer and fall months members of the club make a trip to some point of interest in Indiana.

Wisconsin Registrations—On April 15, 1910, 10,918 owners had registered in the state of Wisconsin. The number of motor cycle licenses issued was 679 and 256 licenses had been granted to motor car dealers, manufacturers and motor cycle agents. When the secretary of state gave out these figures there was general astonishment at the high number. It is estimated that 5,000 cars will be registered during the present year.

Greeting Given Fairbanks—The reception given Former Vice-president Fairbanks on his return to Indianapolis from his tour of the world was an old-fashioned neighborhood greeting from friends and townspeople of all ranks and conditions. In the parade from the railroad station to the speaker's stand at Monument circle only gasoline cars were used to convey the guest of honor and the reception committee, while the members of the committee of women who met Mrs. Fairbanks were appropriately borne in Waverley electrics.

Going on Long Trip—A party composed of Charles W. Eckert, a Lancaster, Pa., millionaire; Joseph F. Stevens, Milton K. Harr and E. L. Steele, of Philadelphia, and James Dunlop Smith, W. W. Tompkins and C. S. Tompkins, of New York, will gather at Philadelphia within a week for a pathfinderless run of about 1,000 miles to Edwardsville, Ga., where they are interested in a mining proposition. There will be seven cars in the run. The route followed will be via Washington, Charlotte, N. C., and Atlanta. There will be a pro-

fessional driver in each car, and the purpose of the run will be a combination of business and pleasure.

Kisselkar Wins Hill-Climb—The annual hill-climb held April 3 at New Braunfels, Tex., was won by a 30-horsepower Kisselkar, which won in 35 seconds, which cuts 6 seconds off the record of last year.

Ohio Names Representatives—Governor Harmon this week announced the appointment of John H. Ruhlman of Youngstown, and Linus B. Kaufman of Columbus, as representatives of Ohio at the international congress on good roads that is to be held in Brussels, Belgium, the coming summer.

Buick Beats National—Bill Oldknow, in a Buick 16, and W. J. Stoddard, in a National runabout, settled a little difference of opinion as to the hill-climbing ability of their cars at Atlanta, Ga., April 9. The Buick was the winner, making the .88 mile in :49½. Stoddard's best time was :54½. The affair was run in two heats. Considerable money changed hands on the result of the race.

Two Popular Roads—Two of the best and most used highways in Spokane county are the Trent and Sprague roads, from the motorist's standpoint. Of these two the Trent road is the better, being in good condition with the exception of about a mile in the city limits, located near the Olive street bridge.

Good Roads Meeting Called—The annual meeting of the Michigan Good Roads Association has been set for May 12 at Grand Rapids and at that time some action will be taken toward inaugurating a national good roads movement. It is planned to ask the government for aid in building roads between the capitals of various states. A road from Lansing, Mich., to Indianapolis, Ind., is the one most favored.

Seeking New Home—Directors of the Grand Rapids Automobile Club have been examining several sites in the vicinity of Grand Rapids, Mich., with a view to the erection of a new clubhouse. It is probable that the old clubhouse at Cascade, which is a rented building, will be abandoned by the club and a new modern building erected within easy reaching distance of the city. The club already is making plans for the annual orphans' day which will be observed some time in June.

Wildwood's Card—A meeting of the North Wildwood Automobile Club was held in Philadelphia and a program for the coming season planned out. Besides numerous dances, receptions and other social fixtures—including a grand flare-out on the occasion of the visit of the Motor Club of Harrisburg's endurance run on the night of May 10—the club is arranging for its Fourth of July and Labor day meets on the Wildwood speedway, besides which there will be a motor cycle meet on August 6. The clubhouse, which has already cost \$12,000, will be further improved at a

cost of \$1,000, and the opening of the seashore season will witness a large accession to the membership, which now totals 104.

New York's Orphans' Day—Thursday, June 2, will be orphans' day in New York city.

Flag-to-Flag Run Off—Official announcement is made that the Denver-City of Mexico reliability run has been declared off because of lack of entries.

Jersey Run Planned—At a meeting of dealers and owners last Friday night, held in response to a call issued by Mayor Madden, of Trenton, N. J. preliminary arrangements were made for an endurance run to be held some time in May. Although no definite date or route was selected it was decided to have a 1-day 200-mile run through the mountains of north Jersey, with Trenton as the starting and finishing point. A score or more of dealers signified their intention of entering at least one car.

New Way to Raise Money—Wilkes-Barre people will be given an opportunity to support the big hill-climb on Giant's Despair on June 11 next, and the members of the Wilkes-Barre Automobile Club, by selling buttons at \$1 per, hope to be able to run the event without the usual deficit. The work of preparing the course will be begun next week, and an effort will be made to have it in such shape that records will fall in all classes. The committee in charge of the climb is made up of J. H. Perkins, T. A. Wright, Guy W. Moore, George W. Lewis and P. S. Ridsdale.

Coup by Game Warden—The motor car has become an important aid to the game warden. The first warden to adopt the modern vehicle is Charles Pierce, of Escanaba, Mich., who will use a car to apprehend violators of the fish and game laws. At this time game wardens in Wisconsin and upper Michigan at least have used horse and buggy to make the rounds, hiring these at livery stables. In a majority of instances the liveryman has telephoned ahead to the illegal fishermen or hunters, making the warden's efforts futile. On his

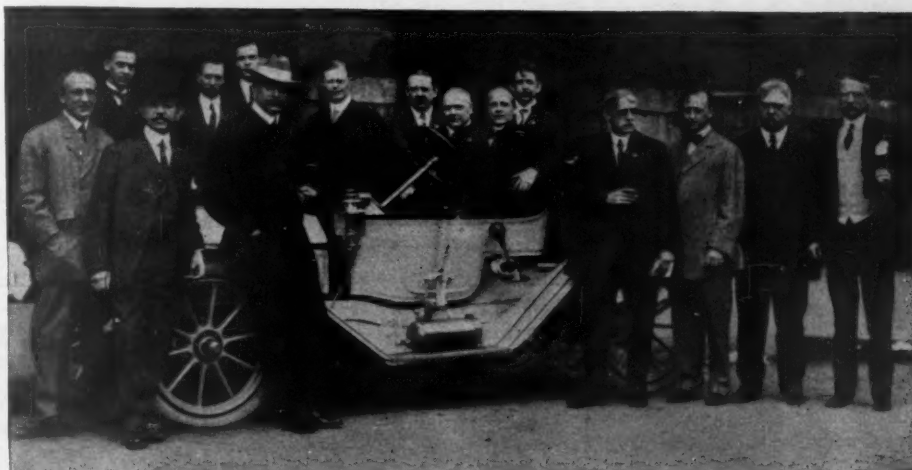
first trip Mr. Pierce covered 66 miles and visited fourteen lakes, gaining about 75 per cent in time and labor.

Nebraskans Won Over—The people of Nebraska persist in their extravagant ways. An average of twenty-five car licenses per day have been issued from the office of the secretary of state during the past week. The estimated expenditure for the popular means of transportation in Nebraska is \$30,000 a day.

Columbus Announces a Reliability—The Columbus Automobile Club, of Columbus, O., has planned a reliability contest to Indianapolis shortly before Decoration day. The contest will be run at that time in order to permit motorists to attend the speed contests on the motor speedway at Indianapolis. The usual rules and regulations will govern the event.

Is Against Motoring—An anti-motor club was organized at Omaha recently. The promoters announce that the purpose of the organization is to protect that portion of the public which does not ride in motor cars. "The car owners have clubs to protect their interests," said one of the anti, "and we propose to look after those who do not own them." The club will demand the strict enforcement of the speed laws and will urge additional legislation placing restrictions calculated to protect the walking public. The officers are: Ed Leeder, president; C. S. Huntington, secretary and treasurer.

Country Home for Bisons—Buffalo motorists are highly pleased with the site recently acquired by the Automobile Club of Buffalo for its country house and farm. The property consists of 70 acres of highly cultivated land located near Clarence Hollow, N. Y., 17 1-2 miles from the city hall, Buffalo. Landscape gardeners will beautify the place and in a small lake located on the farm will be planted several thousand fish-fry. There will be tennis courts, a golf course, baseball diamond and grounds for croquet and bowling on the green. A large rustic bungalow which will have roomy verandas will be built on the property.



OFFICERS OF OHIO STATE AUTOMOBILE ASSOCIATION, DR. HEYL, SECRETARY, AT THE WHEEL

Manufacturers' Communications

Advantages of Unit Construction.

DETROIT, MICH.—Editor Motor Age—There are two types of the unit construction which may be confused with each other. In one type the gearset is combined with the motor; in the other with the rear axle. The former is generally the more approved form of unit construction, as with this the unsprung weight is much less than with the alternative construction.

By combining the gearset and the motor together the length of the propellershaft is increased considerably without adding to the wheelbase. With a longer shaft the angularity of the shaft is decreased and the wear and friction in the universal joints is decidedly reduced because of this construction.

In the best makes of cars having separate motor and gearset, there is a universal joint or two between the clutch and the gearset. These absorb power. In addition, on cars having side chain-drive, there usually are two or four more between the gearset and the sprockets. Where the differential housing is separated from the gearset proper a couple more are often added. This would make eight all together in extreme cases. This multitude of cardan joints is to correct the disalignment due to the twisting of the frame over rough roads. A very rigid frame, which is a practical impossibility, must be supplied, otherwise these members would be constantly out of line. This tends to hard riding, as will be found quickly with comparison with a car having a unit motor and gearset, but a more flexible frame. Since the alignment of the unit is unaffected by any distortion of the frame there is no loss of power due to irregularities in the road surface which has been demonstrated to my satisfaction.

This construction facilitates manufacturing and repairing as the unit can be handled much more easily and quickly than the several combined elements. Likewise in manufacturing no time is lost in lining up each unit with respect to the other. This constitutes a great saving and insures that the parts will be in the correct condition when the work is finished. Since it insures proper alignment irrespective of road conditions and at the same time dispenses with at least two universal joints, there is a considerable gain in power which otherwise would be lost in friction. This permits more power to be delivered to the rear wheels and also adds to the life of the whole mechanism.

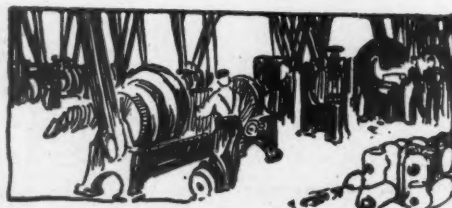
Since from one to four universal joints are dispensed with by this construction, there are just that many parts fewer which need frequent greasing and care, but which

are customarily neglected. Although the rear axle gearset unit possesses the foregoing advantages in conjunction with the motor and gearset unit, it has some defects which would place the motor and gearset unit to the fore. Among these is the carrying of the extra dead weight on the rear axle which is naturally not spring-suspended. Carrying this extra dead weight subjects the tires to unnecessarily severe wear. It is well, therefore, to have as little unsprung weight as possible on the tires.

Another disadvantage is in the inaccessibility of the gearbox since it is located almost directly under the rear seat where it can hardly be reached. For this reason there are grave chances that it may be neglected where one more accessible would be properly cared for. In comparison with the gearset attached to the motor, which is in the most convenient place on the whole car, it is only necessary to remove the floor boards to reach it. Even in the ordinary construction, where the gearset is a separate member from the motor, it has to be set back so far from the clutch that it comes under the front seat in many cars. In either of these last two cases to have equal ease in replenishing the lubricant the body would have to be removable. Such indeed is the case with the English Daimler, for example, the body of which is provided with hinges so it can be raised easily.

Invariably when the gearset is incorporated with the rear axle the bevel pinion is integral with one of the gearset shafts. For this reason if any adjustments have to be made in order to have the bevel gears run more quietly it results in the moving of one of the change-gear shafts also. Moving this often results in throwing the gearbox gears out of their proper positions and noise from this quarter arises, to the annoyance of the owner.

Briefly, the advantages possessed by the motor and gearset combined in a unit are: Disalignment of these two most important elements is possible. Unnecessary universal joints are dispensed with, reducing the frictional losses and diminishing the care required by the car. The angle at which the propellershaft acts is reduced to the minimum for the length of wheelbase used, and the smaller the angle the less wear and frictional losses in the universal



joint. It is more accessible than when joined with the rear axle and better adjustment of the bevel gears may be provided. Above all, more power is noticeably transmitted to the rear wheels when a unit construction is employed.—Chalmers Motor Car Co., Lee Anderson.

Many Classes Benefited

New York—Editor Motor Age—"When the times are ripe for breaking from the present and advancing toward the future, all hesitation is fatal. Rapid movement is the secret of all victories," says Mazzini.

This world is rapidly attaining perfection—approaching the millenium through high efficiency in action, ease in occupation, and complete enjoyment of acquisition. The motor car has given us a long, fast ride in this direction than any other invention of our time. To the question "What is the economic value of the motor car in the world's work?" the best answer is another, to-wit: "What occupations can be benefited by the introduction of higher speed in locomotion?"

The occupations which are directly benefited by the invention and use of the motor car are: First—Those vocations where greater facility and speed in traveling will increase the amount of work accomplished. Representatives of this class are physicians, civil engineers and salesmen, who travel about in doing their work. The second class which is benefited consists of those whose vocations do not require traveling, but who use the motor car for recreation, sightseeing and pleasure. The third class receives benefits, not so much from the motor car per se, as from the stimulus in manufacturing and trade which the construction of motor cars has created.

The most apparent benefit to the first class is the greater speed of the motor car as compared with the horse-drawn vehicle previously used. In the case of the physician, the difference in the time consumed in getting to the patient may mean the difference between life and death. In addition, the greater endurance of the vehicle, rendering it capable of covering many times the mileage of the horse, coupled with the fact that it is more sanitary and more economical, all tend to increase the efficiency in the vocation to which its use is applied. Perhaps to no class is the motor car of more value than to civil engineers and construction firms, who are enabled to widely extend their scope of operations.

The second class is mostly comprised of people to whom the motor car is not a necessity—that is, they did not require the motor car for the sake of economy and utility, but rather acquired the motor car for pleasure, recreation and sightseeing.

Of the third class, those who have been directly benefited are the artisans, mechanics, merchants and others engaged in the manufacture and sale of cars and accessories. Over 250,000 men acquire their living in the manufacture and sale of motor cars and accessories.—Benjamin Briscoe.

THE four 1910 editions of the Official Automobile Blue Book have just been issued by the Automobile Blue Book Publishing Co., 1200 Michigan avenue, Chicago, and with New York offices at 239 West Thirty-ninth street. These four volumes cover roughly the territory as follows: Vol. No. 1, New York state; Vol. No. 2, New England, including New Hampshire, Vermont, Maine, Massachusetts, Rhode Island, Connecticut, and extensions into the Canadian provinces; Vol. No. 3, New Jersey, Pennsylvania, and south through Virginia, the Carolinas, Georgia and Florida; and Vol. No. 4, of the middle west, covering Ohio, Indiana, Illinois, Michigan, Wisconsin, Kentucky, Minnesota, Iowa, Nebraska, Kansas and Missouri. The four volumes, which are issued in the same leather-covered style as a year ago, contain all told 3,500 pages of route information, which information is printed in different form than heretofore in that there are two vertical columns of figures on the left side of each page. One gives the total route mileages from point to point in the first column, and the mileages between towns along the route in the second column. The route directions are printed with that same detail giving every landmark, whether turns to the right or left are made, and the distances of each turn. On roads where toll gates are in existence the amount of toll is given. In these four 1910 volumes 58,000 miles of new route guides, not heretofore published in them, are printed and in order to facilitate finding the road guide for any particular distance a new index system has been installed. In order to do this all the routes of previous issues have been rearranged and renumbered, and in addition to this index of the routes a system of key index maps is used through the four volumes. These four volumes contain practically every new road built in the above territory during the past year. Each route direction is given in both directions, and list of hotels and garages included. In the four volumes over 150,000 miles of road description is given.

Vol. 1 of New York has been thoroughly revised from last year and several new routes in the Adirondacks and Catskill mountains added, with many other desirable routes in the state which heretofore have been neglected.

In Vol. II, of New England, 30,000 miles of routes are described as compared with 20,000 miles in the 1909 issue, and these route descriptions have been condensed to occupy practically the same space. Practically all of the 1909 Red Book information has been transferred to this edition and 10,000 miles of new route descriptions added. Maine has been completely covered, including every route out of and into Belgrade lakes, Rangeley lakes, Moosehead lake, Bangor and Poland Springs. A complete Canadian section is added, giving routes on the principal trunk roads. Many new city maps have been

The Motorists' Bookman

THE 1910 OFFICIAL BLUE BOOKS

included. A feature of this volume is a graphic trunk line chart which enables the tourist to easily lay out an extended trip.

In Vol. III a vast amount of new territory is routed and it is possible for the tourist, starting from Harrisburg, Gettysburg, Williamsport, Pittsburg, Easton, Scranton, Wilkes-Barre, Reading, Lancaster, and other important cities of Pennsylvania to secure the running details of trips in all directions. Nearly all of the old route maps and city maps have been made over and new ones added. A feature of this volume is a new trunk line from New York to Atlanta with a southern digression to Savannah and Florida points. This volume has a total mileage of 24,000.

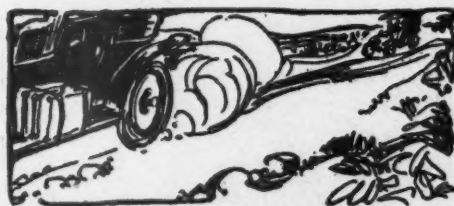
Vol. IV of the west contains 350 routes with a total of 35,000 miles over the states mentioned above. It contains many new city maps and has a trunk line index map in the front of the volume covering the complete territory. This volume contains more than double the 1909 edition.

The information for these four volumes was obtained by four motor cars, each with two experienced route men, who covered the entire territory, correcting old route directions, compiling new, and securing city and territory maps.

"Vehicles of the Air"

It is meet that one who spent his early energies in the interest of the motor car in its pioneer days should take up the question of aerial navigation and become the foremost authority on ballooning and aeroplaning in America. Victor Loughheed, once editor of Motor and author of several interesting papers on the motor car, has in his 500-page volume, "Vehicles of the Air," brought together more interesting information on aerial navigation than any other author up to the present time. The book is brimfull of information that has been compiled from every possible source, much of it never having appeared before in print in any form. To the person who simply knows that balloons rise because they are lighter than air and that aeroplanes fly because the propeller revolves, the volume is a panacea in that it goes first elementarily and then technically into the art and science of ballooning and into the science of aeroplaning.

Besides telling the whys and wherefores



of the balloon and the aeroplane the author covers the complete historical plane of both, going back in balloon history to 1306 when the inscrutable Chinese sent up a balloon at Peking in celebration of the Emperor Fo-Kien. From that date to the present every balloon record is given, those people whom history has marked as milestones in the progress of the art are given a brief life story.

From lighter-than-air machines the author leads to the heavier-than-air type, which is the aeroplane of today, the infant wonder of the atmosphere, and this department of aerial navigation is brought down historically from the earliest efforts of Degen in 1809, who rose to a height of 54 feet by violently flapping huge bird-like wings which had a total area of 116 square feet down to the latest efforts of the Wrights, Bleriot, Paulhan and the other masters of the art. Historically the book is up to date, dealing with constructions and records up to as late as November, 1909. But while the historical may interest many the real merit of Loughheed's "Vehicles of the Air" consists in the manner in which the science of aeroplaning is treated which explains to the reader the laws of air currents, and why the planes of an aeroplane must be paraboloid and not flat.

As aeroplanes have so much to do with air currents and a clear understanding of the atmosphere, the first chapter of over sixty pages is devoted to a study of the atmosphere giving the weight of the air at different altitudes, its composition, its temperature, compressibility and laws. The subject of barometric pressure is gone into in detail as is the matter of humidity and winds. The most valuable scientific features of the book and two of vital interest to aeroplaning are air current and propeller action. Regarding air currents and their effects on the planes of an aerial craft thirty pages are taken from a paper read by Professor Montgomery on "Principles Involved in the Formation of Wing Surfaces and the Phenomenon of Soaring." This paper is a master treatise on the question and has been widely applied in the construction of the successful aeroplane of today. John T. Montgomery, the author of the paper, in April, 1905, experimented in California with aeroplanes liberated from balloons at a height of 4,000 feet and his conclusions are now basic pillars in aeroplane science. The book is profusely illustrated with line drawings showing constructions and illustrating principles and photographic reproductions show every modern aeroplane with a brief description of it. It is published by the Reilly & Britton Co., Chicago.

The Motor Car Repair Shop

THERE are thousands of cases of magneto trouble, which arise directly from an effort on the part of the repairman, driver or owner to locate and eliminate a regular or irregular misfiring in one or more cylinders of a motor, without having first determined whether the fault was in the magneto or the spark plugs. As in all things, one should be systematic in tracing ignition trouble to its source. The first thing to do when a motor misses, and the ignition system is suspected, is to test the spark plug. This is done by loosening the cable from the suspected plug, then while the motor is running, carefully drawing the end of the cable away from the plug terminal and holding it within $\frac{1}{8}$ inch of the cylinder or the base of the plug which is screwed into the cylinder. If the spark jumps across regularly the trouble is in the plug; either the points are too far apart, the porcelain insulation is cracked, or the points are short-circuited with oil, carbon, water or some other mischievous substance. If the spark does not jump regularly at the plug end of the cable, re-attach the cable to the plug and disconnect it at the magneto, and see if the spark jumps regularly at this point, if it jumps regularly, the cable itself is to be suspected, and if it jumps irregularly or not at all, the fault will either be found in the ground wire or switch, or in the magneto.

It is well in testing a magneto, to disconnect the ground wire from the magneto after the motor has been started, for an intermittent short-circuiting of this wire, caused by a faulty switch, pierced insulation or something of that sort will cause misfiring. In the Bosch type of magneto, the ground wire is attached to terminal G, Fig. 1, and anything that will cause a short-circuit or make connection between this terminal and the frame of the car or the engine will make the magneto stop sparking and cause the motor to stop. One advantage of this construction is that, should the magneto switch ever become inoperative and the driver unable to stop the motor in the regular way, he can do so by taking a screwdriver, a piece of wire or the like, and making connection between this terminal and some metal portion of the engine.

In the assembly and arrangement of the Bosch magneto every effort has been made to render it foolproof, and almost every feature which is at any time liable to need inspection or adjustment, can be reached or disconnected without the use of any tool, other than a screwdriver and a little wrench furnished by the Bosch company at a cost of 10 cents. The terminals numbered 1-2-3 and 4 in the illus-

Hints for the Amateur

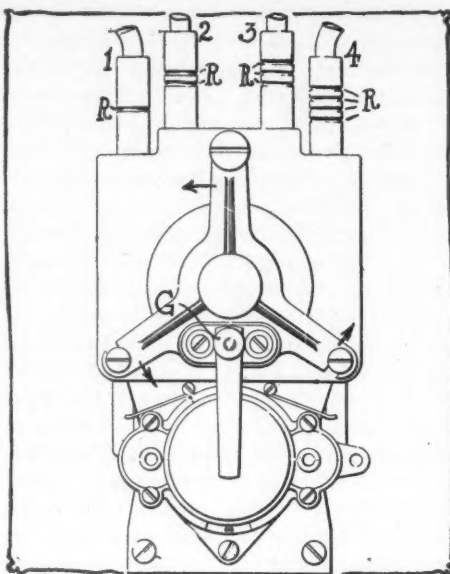


FIG. 1—REAR END OF BOSCH MAGNETO

tration may be readily pulled up out of their sockets, each socket is numbered and each terminal has 1-2-3 or 4 rings or annular grooves R on its hard-rubber insulator which indicates the number of the socket to which it belongs. These grooves are not always to be relied upon, however, for unfortunately some manufacturers of cars have neglected to take advantage of this feature, and have wired up their cars without regard for the relation between

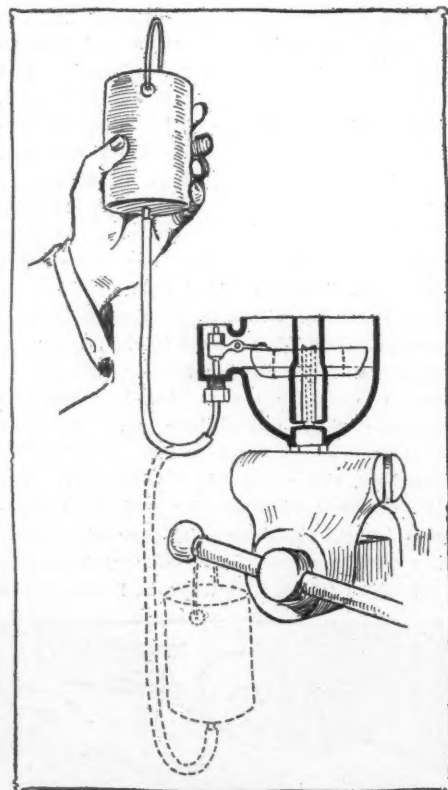


FIG. 2—REGULATING CARBURETOR FLOAT

these grooves and the figures next to the sockets. In next week's issue some characteristic magneto troubles will be shown and methods of reaching and repairing the affected parts described.

Carburetor Float Adjustment

In the illustration designated Fig. 2, the means employed by a local repairman for regulating the float level in a carburetor are shown; and consist of a can with a wire handle, a piece of copper tubing soldered to the bottom of it to form an outlet, a piece of rubber tubing and a nipple or short piece of tubing with a coupling adapted for attachment to the carburetor. In regulating the float-level of a carburetor, several adjustments of the nuts on the stem of the valve are generally required before the proper level is obtained; and as each adjustment must be tried, and each trial necessitates draining and refilling of the carburetor in the regular way, a suitable means must be provided for conveniently draining and refilling. Such a means is shown in the accompanying illustration.

Before the float of any carburetor can be properly adjusted, the operator must familiarize himself with the use or purpose of the float, its co-operation with the valve which admits or stops the flow of gasoline into the float-chamber, and the relation between the float-chamber and the spraying-nozzle. He must know that as the gasoline flows past the valve into the float-chamber of the carburetor, the float should rise as the level of the fuel rises, and as the float rises it automatically closes the valve and regulates the flow of gasoline into the float-chamber. He must also know that the level maintained in the float-chamber is the same as that in the spraying-nozzle; and that the required level which is to be maintained in the spraying-nozzle must be known in order to determine the proper float-level. Owing to the variation in the suction of different motors on a carburetor, it is often found that a slight variation of the fuel level, or a slight change in the size of the spraying-nozzle, adds greatly to the efficiency of the motor. The first thing to do, then, before attempting the adjustment of a float is to learn whether or not the float needs adjustment; a flooding carburetor does not always indicate that float adjustment is necessary, for a piece of dirt or anything that may prevent the valve from seating will cause flooding. The proper level of the fuel in the nozzle or float-chamber of a carburetor can be learned either by experiment or from the manufacturer of the motor or carburetor, and Motor Age advises that, when in doubt, consult the manufacturer.

Current Motor Car Patents

Demountable Rim Wheel—No. 954,076, dated April 5; to Roswell H. Buckingham, Barberton, O.—The demountable rim wheel covered by this patent, differs from all other types of wheels now in use, in that the rim is rendered demountable by means of telescoping sleeves on the spokes. As shown in Fig. 1, the inner ends P of the spokes are rigidly secured to the hub of the wheel in a conventional manner, but instead of entering directly into the felloe of the wheel, sliding sleeves S are mounted upon them, the conical ends E of which are adapted to fit into conical recesses F in the felloe of the wheel, when extended. The ring R, which is rotatably mounted on the hub of the wheel, has a series of cam recesses C sunk in it, each of which is adapted to engage a pin P, attached to the sliding sleeves; and by rotating this ring, the sleeves on the spokes are simultaneously moved into and out of engagement with the rim of the wheel. A means is also provided for locking the ring R against rotation.

Explosion Engine—No. 954,219, dated April 5; to Edwin E. Slick, Pittsburg, Pa.—This patent relates to a cylinder construction for an internal combustion engine, in which the clearance or combustion chamber is formed by an elongated cylindrical extension of the cylinder head, as shown in Fig. 2. The proper clearance volume is maintained in this construction by decreasing the diameter and increasing the depth of the combustion chamber. As illustrated, this construction is of the air-cooled, four-cycle type, with the intake-valve I, situated nearest the inner end of the clearance chamber, the spark or ignition plug S opposite the inlet-valve, and

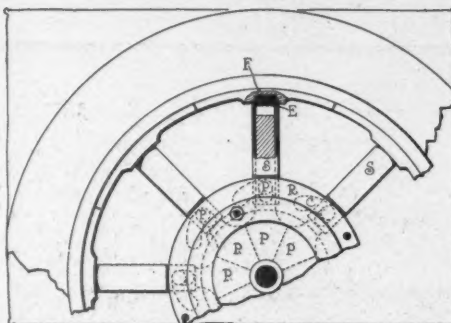


FIG. 1—DEMOUNTABLE WHEEL RIM

the exhaust valve E located near the extreme outer end of the clearance chamber.

Two-Cycle Engine—No. 954,208, dated April 5; to Eugene C. Richard, Lansing, Mich.—The motor covered by this patent is of the two-cycle, water-cooled type, with an auxiliary cylinder, of large diameter and a short-stroke piston, to supply a combustible fuel mixture to the working cylinder under pressure. As illustrated in the side section shown in Fig. 4, there is a working cylinder A, a supply cylinder attached at the right lower end of it, and cylinder ports C, F and D, in the walls of the working cylinder, F being indicated by dotted lines. C is a scavenging air supply port; D communicates between the working and fuel-supply cylinders; and there is an exhaust port just above the port F, which is also indicated by dotted lines. The working piston has an annular projection to its head which is of smaller diameter than the cylinder, and there are ports communicating with the annular chamber thus formed in the piston head, which lead to the periphery of the piston. When the motor is in operation, at the end

of the working stroke, the ports C and D are open, the air compressed in the crankcase enters the cylinder through the port C and forces out the burned gases, while the fuel enters, behind the air, through the port D. As the working cylinder rises and compresses the fresh charge, the piston of the supply cylinder descends, producing a vacuum, and as the working cylinder nears the top center, connection is made between the ports F and D by means of an annular groove around the bottom of the working cylinder, through which a fresh charge is admitted to the supply cylinder.

Four-Cylinder Vertical Opposed Engine—No. 954,095, dated April 5; to Fred. L. Gregory, Chicago, Ill.—This patent covers a type of internal combustion engine, in which there are four L-type water-cooled cylinders, all arranged in the same vertical plain, with the members of each pair having opposed open ends. A side view of the engine is shown in Fig. 3. The carburetor C is located at the front of the motor; inlet gas manifolds I lead around the sides of the cylinders and conduct the mixture to the sides of the valve chambers V; an exhaust pipe E receives the exhaust gases which issue from the rear of the valve chambers; and the valves are all located on the rear side of the motor and mechanically operated from a single transverse camshaft S. The power from the pistons is delivered through a tubular rock-shaft, located in the space between the two vertical pairs of cylinders, to the crankshaft K, to the rear end of which the flywheel F is attached; and the camshaft is gear-driven off the shaft R, which in turn is geared to the crankshaft K.

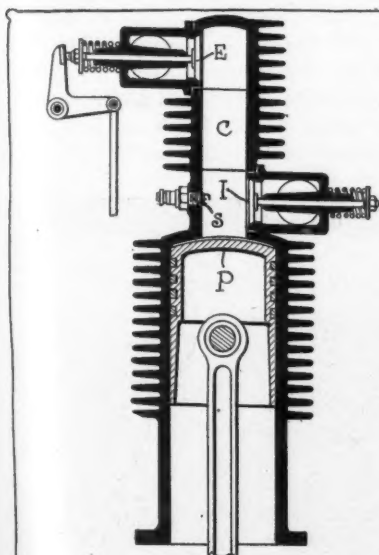


FIG. 2—EXPLOSION ENGINE

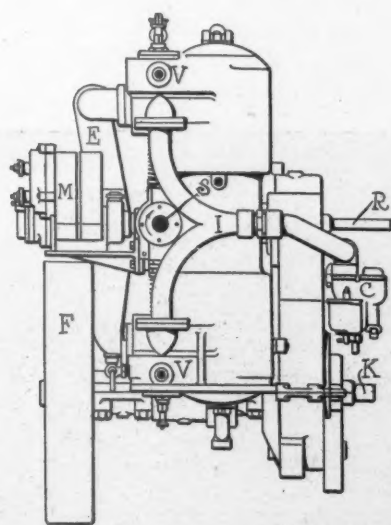


FIG. 3—FOUR-CYLINDER VERTICAL OPPOSED

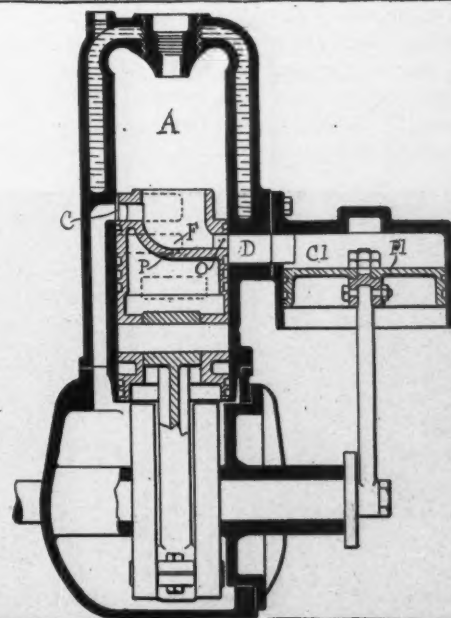
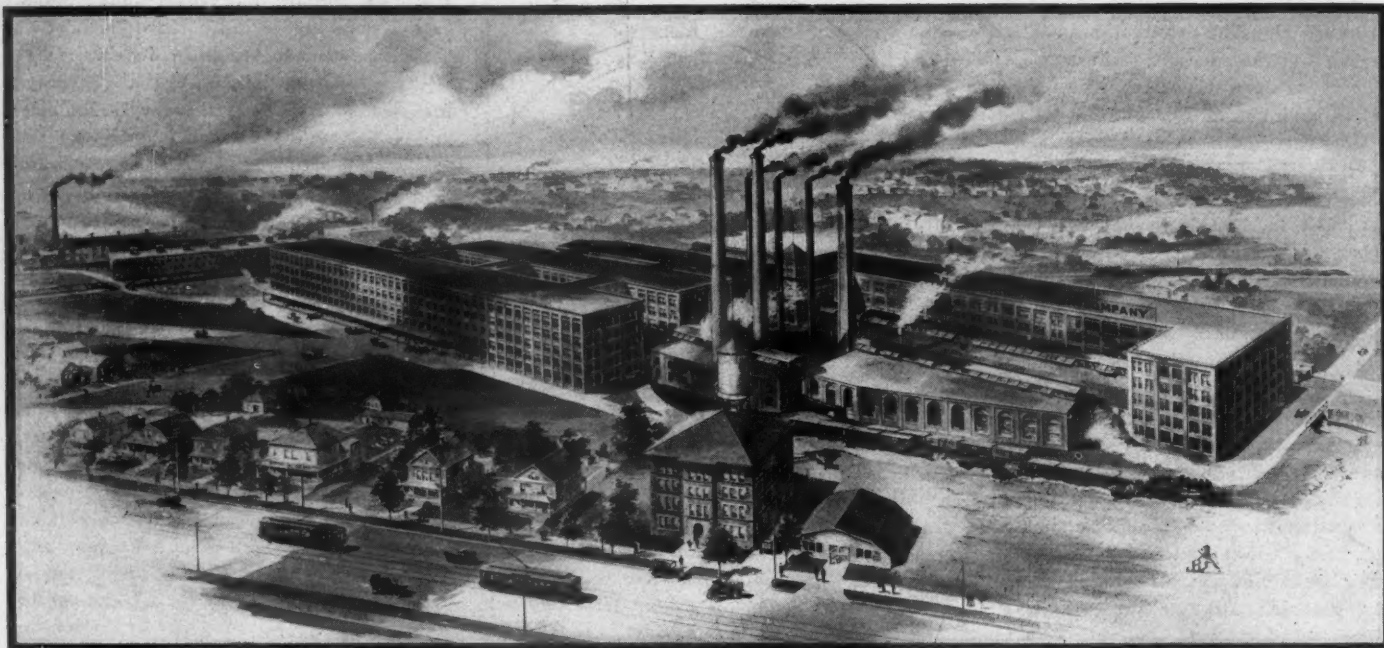


FIG. 4—TWO-CYCLE ENGINE

Among the Makers and Dealers



GIGANTIC PLANT OF THE GOODYEAR TIRE AND RUBBER CO. AT AKRON, O.

Winton Off for Europe—Alexander Winton sailed last week for a European trip and will stop in Paris.

Tire Company Doubles Stock—The Miller Rubber Co., of Akron, O., has increased its capital stock from \$250,000 to \$500,000. The company has more than doubled its capacity during the last 12 months; and new buildings have been completed to take care of the increased tire business.

Chadwick After More Room—Unable to expand in its present location, at Pottstown, Pa., the Chadwick Engineering Works will be compelled to seek new quarters in the near future. The Light Mfg. Co., whose plant adjoins the Chadwick factory, also is cramped for room, and has proposed to take over the latter's establishment. The local commercial league has interested itself in the matter and is en-

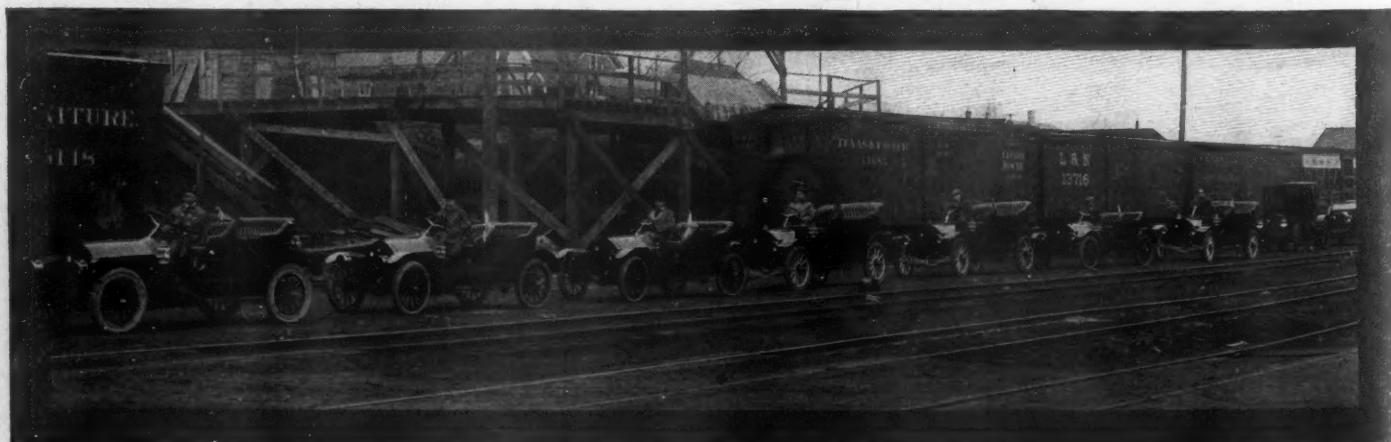
deavoring to keep the Chadwick plant in town, as it proposes to increase its force to 500 men as soon as it secures the necessary room to build.

Preparing for 1911—The Lewis Spring and Axle Co., of Jackson, Mich., will double its capacity for 1911. The company now has in operation five plants in Jackson, producing springs, forgings, control sets, front and rear axles, etc. The American Distributing Co., of Jackson, is the sales representative of the Lewis Spring and Axle Co.

Goodyear Prosperity—The Goodyear Tire and Rubber Co., of Akron, O., has let contracts that will increase its floor space and power plant 125 per cent over what it is at the present time. This will give the company a total plant acreage of 12 acres and this year's expansion alone will

add over 300,000 feet additional floor space and 3,000 horsepower to the power plant. By the end of 1910 the company will have a capacity of 2,500 motor car tires a day and will have trebled its capacity in motor truck tires.

Schacht Enlarging—The Schacht Mfg. Co. is enlarging its factory. It has drawn up plans for a new factory building which will enable it to treble its output in 1911. The specifications for the building call for a structure 600 feet long by 60 feet wide and three floors, built of brick, concrete and steel, with the side walls consisting almost entirely of glass, permitting perfect light in every part of the building. The cost of this improvement will be approximately \$90,000, and it will be located on Spring Grove avenue. The company also has decided to increase its capital stock



FLEET OF KISSELKARS READY TO BE DRIVEN OVERLAND BECAUSE OF SCARCITY OF FREIGHT CARS



LINEUP OF WAVERLEY ELECTRICS AND COMMERCIAL WAGONS IN RECENT INDIANAPOLIS PARADE

from \$100,000 to \$500,000. It anticipates making 6,000 machines for the season of 1911.

Owen Made Vice-President—Raymond M. Owen has been elected to the vice-presidency and directorate of the Reo Motor Car Co., Mr. Owen having recently acquired a large interest in the Reo from R. Shettler, the retiring vice-president. Mr. Owen's association with R. E. Olds dates back to 1900.

Winton Activity—The Winton company has broken ground for a new building to be used for the repair and parts department. It will be a steel construction with brick walls, three stories high and 308 by 70 feet in dimensions. A larger section of the first floor will be devoted to car storage, the second floor given up to repair painting and upholstery and the third floor to machine and general repair work. The building now occupied by the department will be given over to the assembling department and the latter's present building will be converted into a stock department. It is also planned to erect a special foundry building when the quarters now occupied by the foundry will be devoted to sheet metal and punch press work.

Canadian Plant for Anhut—It has developed that the recent increase in the capitalization of the Anhut Motor Car Co., of Detroit, was made for the purpose of taking over the plant of the Chatham Motor Co. of Chatham, Ontario. By securing the entire equipment, property and buildings of the Canadian concern, which occupies 6 acres, the Anhut company will double its capacity. The increase in capitalization was from \$150,000 to \$300,000 and was mostly all taken care of by prominent men of the Canadian city. The Car Makers Selling Co., of Chicago, factory sales manager for the Anhut company, has taken the entire output of the Canadian plant and agencies have been established at Winnipeg, Montreal, Toronto and throughout the Canadian northwest. The car which is to be manufactured at the Canadian plant will be a duplicate of the six-cylinder machine now being turned out at the Detroit factory. President Anhut

states that he expects to have nearly 200 cars delivered from the Chatham factory by July 15.

Adds Dart—The Car Makers Selling Co., of Chicago, has taken over the sales agency for the Dart light delivery wagon. This car has a capacity of 700 pounds.

Drive Cars from Factory—In order to prevent a freight congestion at the factory at Hartford, Wis., Kisselkar agents within a radius of 150 miles of the plant are saving time by driving the cars overland from the factory to their stores. Such a trip recently was made by H. P. Branstetter, the Chicago representative of the Kisselkar.

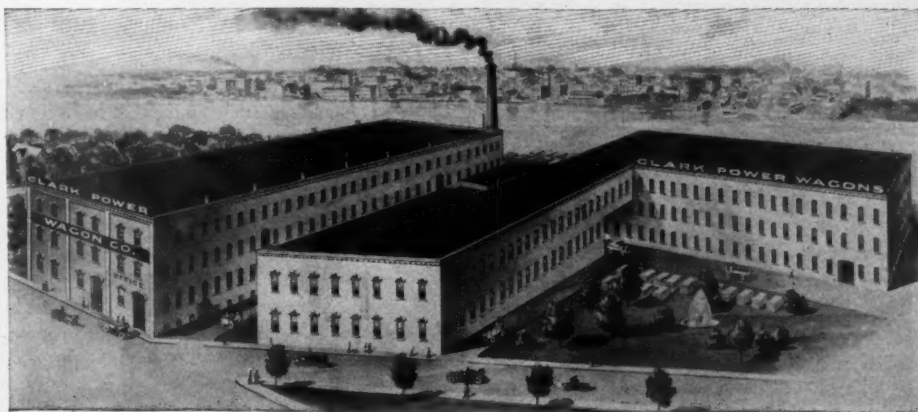
Mid-Year Shows Proposed—With business at a record stage the two dealers' organizations in Kansas City are thinking in spare moments of two mid-year motor shows, one to be held in conjunction with the Kansas state fair at Hutchison, Kan., and the other a part of the Missouri Valley fair and exposition at Electric park, Kansas city. Both shows will be late in September. The Kansas state fair's motor department is under the exclusive direction of A. M. Blake, secretary of the Kansas City Automobile Dealers' Association, but is not confined to members of that organization. Display space to the extent of 400,000 square feet have been conceded to the motor dealers. A mammoth tent will house the exhibits. The motor department of the Missouri Valley fair and

exposition will be housed in the music pavilion of Electric park in Kansas City, and will consist solely of exhibits of the motor car trade association.

Organizing the Dealers—Efforts are being made in Philadelphia and Baltimore to form associations for licensed dealers only, calls having been issued in those cities for meetings this week. The Philadelphia session was held Tuesday.

Trade in Kansas City—Trade volume is a sure-thing barometer of trade condition. The Buick branch in Kansas City just reports a business of \$408,000 for the month of March, 1910, exceeding its former high water mark of June, 1909, or \$376,000.

St. Louis Election—The Automobile Manufacturers and Dealers' Association, of St. Louis, Mo., has elected the following officers and directors: President, H. B. Krenning; vice-president, E. C. Michel; treasurer, Samuel Bredon; directors, Samuel S. Primm, W. C. Capen, W. B. Fowell, F. R. Tate and John H. Phillips. There was no change in the officers from last year, but the board of directors is a new one. The association went on record as being opposed to reckless driving, adopting a resolution pledging all the aid possible to the new chief of police in his effort to suppress joy riding. It also was decided that the association will give a reliability contest this summer, but the exact date was not decided upon by the members of the association.



PLANT OF RECENTLY FORMED CLARK POWER WAGON CO., OF LANSING, MICH.



News from the Motor Clubs



After Signboards—The Carbon County Motor Club has been formed at Mauch Chunk, Pa., with O. O. Jarrard, president; Walter Bertollette, secretary, and George Driesback, treasurer. The first work of the new organization will be the improvement and signboarding of the roads in Carbon county.

Organize at Joliet—The Will County Good Roads and Automobile Association was formed at Joliet, Ill., last week and immediately affiliated with the Illinois State Automobile Association. The organization is out of the ordinary in that its membership includes owners of horse-drawn vehicles as well as motorists—all working for good roads.

A. C. A. Election Results—The annual meeting of the Automobile Club of America resulted as follows: President, Henry Sanderson; first vice-president, John E. Borne; second vice-president, Robert Lee Morrell; third vice-president, Edward Shearson; treasurer, Finis E. Marshall; governors, Dave H. Morris, Albert H. Shattuck, E. H. Gary, Alfred Ely, George Moore Smith.

Beginning Early With Orphans—Oklahoma orphans were given a ride by the Oklahoma Automobile Association last Sunday. About 300 children were given the treat of their lives. A large proportion of them never had ridden in a motor car before. The Oklahoma association is waging a campaign for an enlarged membership. There are 750 motorists in the city and but 150 have joined the association.

Shamokin's New Board—The Shamokin, Pa., Motor Club held its annual election, at which the following officers were chosen to serve during the ensuing year. C. Q. McWilliams, president; T. J. Mullen, first vice-president; George W. Robertson, second vice-president; George John, secretary, and F. P. Llewellyn, treasurer. It was decided to promote an endurance run in the near future and application was made to join the Pennsylvania Motor Federation.

Kansas City Ambitious—The Automobile Club of Kansas City is now established in its comfortable club rooms in the Midland building, Kansas City, Mo. New members are coming in at the rate of fifty a month. The club is now holding sociability tours every 2 weeks, has a hill-climb scheduled for April 30, races are billed for May 28 and 30 and July 13, and has under consideration the route of the Star trophies tour of 1910—the club's big yearly event in which fifty-nine cars were entered last year. The route next year will either be south to Dallas, Tex.,

and return, taking in four states, or southwest over the old Santa Fe trail to Santa Fe, N. M., taking in Missouri, Kansas, Colorado and New Mexico.

Election at Aurora—Officers were elected as follows by the Aurora Automobile Club, of Aurora, Ill.: President, Walter Egermann; vice-president, C. B. Phillips; secretary, E. M. Currier; treasurer, Wilbur Thorne; financial secretary, M. E. Woolf; chairman tours and runs, S. E. Miller; good roads committee, T. B. McKnight and S. E. Miller.

Canadians May Reorganize—The Manitoba Motor League which was disbanded at the annual meeting last month will likely be succeeded by an association which will have control of all matters pertaining to motoring in the western part of the province, leaving the eastern half to the Winnipeg club. Nothing definite has been done, however, in this connection beyond the appointment of a committee to consider the matter.

Prosperity at Hartford—At the annual meeting of the Automobile Club of Hartford, of Hartford, Conn., the following officers were elected for the ensuing year: President, C. H. Gillette; vice-president, Arthur G. Hinkley; secretary, Phillip E. Curtiss; treasurer, C. De Lancey Alton, Jr. The report of the secretary shows a membership of 337 at the present time. The total receipts for the year were \$4,334.77, while the disbursements were \$4,287.04.

Club Election at Superior—The Superior Automobile Club, of Superior, Wis., has elected the following named officers: Wilbur Ross, president; Dr. George Saunders, vice-president; A. T. Roth, secretary; Dr. H. J. O'Brien, treasurer; directors, Sam Anderson, Dr. J. A. Rene and W. S. Wingate. At the annual meeting it was voted to push vigorously a campaign for the improvements of streets within the city of Superior and those tributary to it. Chiefly through the influence of the club the board of supervisors of Douglas county has started on a system of country roads.

Portland Club Prospering—At the annual meeting of the Portland Automobile Club of Portland, Ore., improvements were agreed upon which will place this enterprising club in the front rank. A \$15,000 club house, \$1,000 worth of road signs, the hiring of a permanent secretary, increased membership, and co-operation with the Oregon State Automobile Association are some of the prospects the 380 members of the club have in sight. One of the most important steps taken at the meeting was the recommending of the building of a clubhouse, the cost of which is left to the discretion of the board of directors. The

club already owns a 20-acre site on the Base Line road near the Sandy river, which is regarded as one of the most beautiful spots on the road to Mt. Hood.

One More for Wisconsin—Owners at Manitowoc and Two Rivers, Wis., are organizing a club, one of the objects of which is to improve country roads and to raise funds for placing sign boards in Manitowoc county. Both cities are objective points of many parties during the touring season. J. E. Hamilton, millionaire manufacturer of Two Rivers, is slated for the presidency, and Edward J. Carroll, of Manitowoc, will be secretary. About 100 members will sign the charter, it is expected.

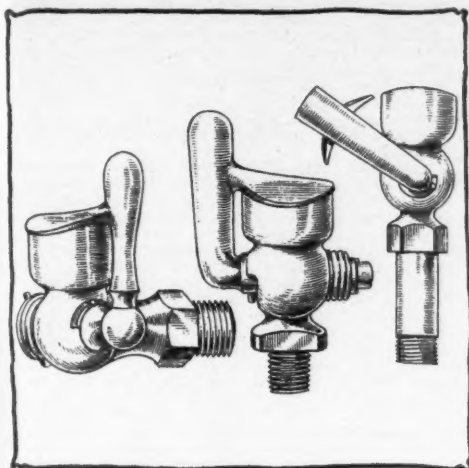
Timers and Scorers Form Club—Expert timers and scorers of Philadelphia, to the number of twenty-two, have formed the Timers and Scorers Club of Philadelphia. Automatic electric timing devices will be used and in the Fairmount race the club will erect a score board of an improved type. For the Quaker City Motor Club's reliability tour April 30 to Atlantic City, synchronous clocks at Philadelphia and Atlantic City will settle any possible disputes as to running time. E. S. Nyce has been named chairman of the timing committee.

Milwaukeeans Celebrate—A love feast of an unusual nature ended the winter season of the Milwaukee Automobile Club on Wednesday night, April 20. A stag lunch, with vaudeville, was given at the Forstkeller, one of the most unique resorts in the country. The affair was in a manner the celebration of the decision of the club to build the proposed clubhouse at a cost of \$14,000 and Blue Mound and Cottrell avenues. The club now has a membership of 400, and this will be increased to 2,500 by July 1, it is expected. There are nearly 5,000 owners in Milwaukee and the percentage of owners who are members of the club is considered much too small so a membership campaign is on.

New Club at Appleton—The Outagamie Automobile Club is the name of a new county association of owners formed at Appleton, Wis., by thirty prominent citizens. Frank J. Harwood was elected president. The other officers are: Vice-president, Charles Hagen, of Black Creek, secretary and treasurer, P. M. Conkey, Appleton; directors, Samuel J. Ryan, M. F. Barteau, Jacob Wolf, Dr. Laird and Sam Whedon, of Appleton; Dr. Charles Boyd, of Kaukauna; Arthur Miller of Seymour; A. K. Dewick, of Shiocton, and A. Heller, of Hortonville. The club starts with a membership of sixty-two, which it expects to double in a short time.



Development Briefs



DURTOUT PRIMING CUPS

STEWART & CLARK MFG. CO., Chicago, is marketing its new Stewart Special speedometer built on the multipolar magnetic principle. This speedometer has two ring-type magnets C, which are separated by an insulating plate. These magnets are carried on a hub part T which has an integral internal gear F in mesh with the pinion E, so that the magnets are rotated in direct relationship with the speed of the car through shaft D on which the pinion E is located. The faster the car travels the faster the magnets C rotate. The indicating part of this speedometer is a metal disk J which has a low magnetic resistance and is made exceedingly light. This disk is carried on the polished pin I, and on the upper end of this pin is secured the pointer N which indicates the miles per hour at which the car is traveling. The theory of operation in this instrument is that as the rotor, consisting of the magnets C, is revolved, the lines of force flowing from the magnets through the disk J cause it to tend to revolve in the same direction as the rotor. This tendency to revolve, however, is resisted by a spring M, one end of which is secured to the shaft I and the other to the fixed plate K, and this tendency to revolve, on the part of the disk J, is exactly proportionate to the speed at which the rotor revolves. By reason of this arrangement of the magnets a continuous torque or drive on the disk J is maintained, which is claimed to insure a steady and even movement of the indicating needle N.

The manufacture of this speedometer is carefully carried out. All of the mechanism, including the odometer feature, is carried in a one-piece drawn-brass cup A. Within this cup is a framework U on which the parts of the speedometer are assembled. This framework being machined with integral sockets,

Stewart Special Speedometer

bosses, shoulders, etc., for the attachment of all the speedometer parts. The permanent magnets C are made from a special analysis of imported Tungsten steel and are machined to a finish. They are hardened in a furnace specially designed for the work and are magnetized, aged, and tested before being assembled. The central stud G, which carries the two ball bearings for the support of the rotor, is recessed to receive a cap-and-crown jewel bearing H, and set in this bearing is the polished shaft I which carries the indicating needle.

The odometer mechanism is interposed between the plate K and the dial O forming the top face of the instrument. This odometer mechanism is driven from the spindle D through hardened steel gears, S indicating the drive connection to the odometer mechanism. The dial is an etched one, imported ball bearings are used, and the instrument is claimed to weigh nearly a pound less than former models. The dial

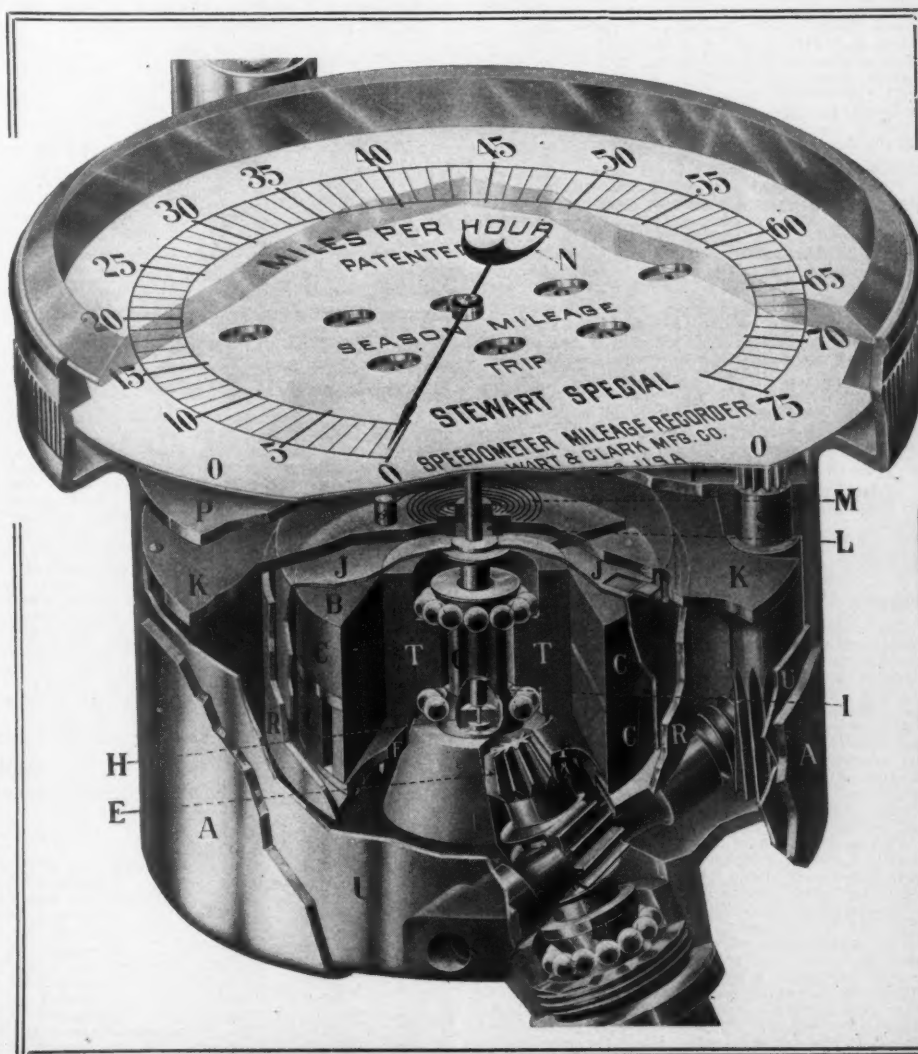
in the 75-mile instrument illustrated is 4 inches in diameter and contains a 100-mile trip odometer and a 100,000-mile season odometer. These speedometers are all driven by the Stewart flexible shaft from the road wheel, and the swinging pivot joint heretofore used is employed.

DURTOUT PRIMING CUPS

Charles E. Duryea, Reading, Pa., manufactures the Durtout priming cup, the feature of which is that the handle which controls the valve in the priming cup has an arched top to cover the top of the priming cup to keep out the dirt. These priming cups are made in three sizes, the long, short and elbow type. They are made with $\frac{1}{8}$ -inch threads.

MILLER TRUCK TIRES

The Miller Truck Co., Akron, O., manufactures solid rubber tires for truck use. These tires are of the sectional type, any of which sections may be applied, removed, or repaired with no tools other than a hammer and wrench. These sections are $1\frac{1}{4}$ by 2 inches in size.



STEWART SPECIAL MULTIPOLAR MAGNETIC SPEEDOMETER

COPPER-ALUMINUM ALLOYS WITH MANGANESE

WITH regard to the relation between primitive yield-point and range of maximum stresses, the actual figures are given in table 32.

Impact Tests on Rolled Bars

These were also carried out on specimens cut from bars rolled to 13/16 inch diameter.

Single Blow Impact Tests

These were made on the Izod impact tester on notched specimens, 2 inches by 3/4 inch by 3/16 inch, and gave results shown in table 33.

The presence of manganese has a decidedly advantageous effect as regards resistance to sudden shock.

Repeated Bending Impact Tests

These were carried out in a machine specially designed for this purpose. The specimens, taken again from rolled bars 13/16-inch diameter, were turned to 1/2-inch diameter with a V notch in the center, such that the diameter at the bottom of the notch was 0.40-inch. They were placed on knife-edges 4 1/2 inches apart and struck over the notch by a falling tup alternately at each end of a diameter. The reversals of the specimen between successive blows was performed by a link-motion attached to the machine. The results of the tests are given in table 34.

It will be seen that table 34 really represents two distinct series of tests, one with a tup weighing 6.15 pounds and falling through a height of 2.01 inches, while in the other the tup weighed only 4.71 pounds and the height of fall was only 1.01 inch. In the former series the stresses at each blow are decidedly above the elastic limit of the material.

The second series of tests, with the lighter blow, was carried out under the conditions which have been adopted in the laboratory for testing iron and steel under repeated bending impact, and the results given by the alloys under these conditions—indicated by an asterisk in table 34—are certainly remarkable, since the highest figure yet obtained with Swedish Bessemer steel is 6,000 blows, or less than one-half that given by alloy No. 3. As the deformation produced by the blows in this series of tests is to a considerable extent elastic, the lower modulus of elasticity of these alloys as compared with steel no doubt accounts for the higher results given by the alloys to some extent, but for practical purposes—provided that the lower elastic modulus is not in itself a disadvantage—the consequent power of absorbing the shock of repeated blows without injury may prove of considerable value.

Some Abrasion Tests

These were carried out in a machine designed for the purpose. Specimens in the form of disks 1 inch in diameter and 3/4 inch thick were subjected to rolling abrasion in contact with a hardened steel roller 2 1/2 inches diameter under a load of 789 pounds. After 107,000 rotations the weight of material removed was found to be for:

Alloy No. 2.....11.6 milligrammes
Alloy No. 3.....13.0 milligrammes
Alloy No. 6.....10.0 milligrammes

For comparison, similar tests were made on disks of ordinary rail and tool steel and the weight of material removed from these specimens after the same treatment was:

For the rail steel...64.5 milligrammes
For the tool steel...27.4 milligrammes

These results, in view of the great ductility of these alloys, are certainly remarkable and appear to indicate a valuable possibility for their application in situations where great resistance to abrasion is required in combination with great strength and ductility.

Tensile Tests on Heat-treated Specimens

The heat-treatment experiments now to be described were only carried out after the work on the constitution of the alloys had been carried to a considerable extent; logically, the account of tensile tests on heat-treated specimens should therefore follow the section on the constitution of the alloys, but for convenience and continuity the author prefers to describe the results here in connection with the other mechanical tests. The heat-treatment employed was based on a knowledge of the critical points of the alloys as determined by means of heating and cooling curves.

The specimens employed in these experiments were: First, the rough sand-castings, and, second, pieces cut from the 13/16-inch diameter hot-rolled bars, and in each case two specimens were placed in a muffle furnace close together, with the thermo-couple attached to one, and a wire, by means of which it could be pulled out and quenched, attached to the other. The former specimen was kept in the furnace for the annealing experiment, while the latter was employed for the quenching test. The specimens were heated up in the muffle and maintained at the desired temperature for one hour; then one was quenched in a trough of cold water while the other was allowed to cool down

PART VI

EDITOR'S NOTE—The following is the sixth installment of the ninth report of the alloys research committee of the Institute of Mechanical Engineers of Great Britain, which report was presented in full during the session, January, 1910. The authors of this report are Dr. W. Rosenhain and F. C. H. A. Lantberry, of the National Physical Laboratory, Tellington, Eng.

TABLE 32

Alloy No.	Ratio	Maximum Range Primitive Yield
2	1.07
3	1.16
6	1.22

TABLE 33

Single-blow Impact Tests—Izod—on Alloys Nos. 2, 3 and 6

Alloy No.	Foot-pounds Absorbed	Mean
2	{ 10.3 9.5 }	9.9
3	{ 9.7 10.1 }	9.9
6	{ 10.3 10.5 }	10.4

TABLE 34

Repeated Bending Impact Tests on Notched Specimens of Alloys Nos. 2, 3 and 6

No. of Alloy	Weight of Striking Tup	Height of Fall in inches	Number of Blows for Fracture
2	{ 6.15 6.15 4.71 }	{ 2.01 2.01 1.01 }	{ 916 919 10,006*
3	{ 6.15 6.15 4.71 }	{ 2.01 2.01 1.01 }	{ 761 762 12,713*
6	{ 6.15 6.15 4.71 }	{ 2.01 2.01 1.01 }	{ 600 626 11,396*

in the furnace—a process occupying from three to four hours.

1—Sand-castings

The results obtained in sand-castings are given in table 35.

Alloy No. 2A.—In this alloy annealing at both temperatures materially injures the metal, reducing both the ultimate stress and the elongation. Quenching from the lower temperature somewhat improves the alloy as compared with the annealed condition, but does not restore it to the strength of the untreated castings, the elongation being still decidedly lower. Annealing at 800° C., which is equal to 1,472° F.—produces very little more effect than annealing at 550° C.—1,022° F.—a result which is remarkable, because while the effect of annealing at 550° C. on the micro-structure is very light, that of annealing at 800° C. is very marked, producing a very coarse structure. Quenching from 800° C. results in a very

marked change of properties corresponding to the marked change of structure.

Alloy No. 3A.—In this alloy the effect of annealing at 550° C.—1,022° F.—is very slight except as regards elongation, which is considerably reduced—to 15 per cent from 24 per cent—quenching from 550° C. restores the material to its original tensile strength but does not improve the elongation. Again, the effect of annealing at the higher temperature, in this case 850° C.—1,562° F.—is very little greater than that at 550° C., while the effect of quenching is again to harden the alloy, producing a high tensile strength with very low elongation.

Alloy No. 6A.—This alloy differs from the other two, and indeed from all the stronger alloys of copper and aluminum, in being improved rather than injured by heat treatment at 550° C. Annealing at that temperature, whether followed by slow cooling or quenching, leaves the ultimate strength practically unchanged, while the elongation on 2 inches is increased from about 26 per cent on 2 inches to 35 and 31 per cent respectively. Annealing at 900° C.—1,652° F.—still further improves the ductility of this alloy while decidedly reducing the tensile strength, while quenching from 900° C. hardens this alloy less than the other two and still leaves it an elongation of 9 per cent. These results suggest that the higher manganese content of this alloy materially modifies its behavior at high temperatures and suggests the possibility of its application for purposes where either occasional or continued exposure to heat is involved. The actual behavior of the alloy under tensile tests at high temperatures does not show any material advantage over that of the other two, but from the point of view of durability under prolonged exposure to moderate temperatures the special character of this alloy may be found to give it a decided advantage.

It was thought that by a modification of the heat-treatment described above the metal might be obtained in a condition intermediate between that of the original untreated casting and the hardened condition of the specimens quenched from high temperatures. For this purpose a set of sand-castings of these three alloys were heated to the temperatures of 800°, 850° and 900° C. respectively, but for 15 minutes only instead of the hour given them in the earlier experiments; at the end of this time they were quenched and gave results shown in table 36.

It will be seen that the results to a certain extent bear out the anticipations upon which the experiments were made; the alloys are not quite so severely hardened, but the increase in the elongations is not sufficient to be really important, and further experiments in this direction have not been carried out, as apparently the increase in elongation is only obtainable by a corresponding reduction in ultimate strength.

Bars Hot-Rolled to 13/16-inch Diameter

An exactly similar series of heat-treatment experiments were also carried out on specimens cut from bars which had been hot-rolled to 13/16-inch diameter. The results obtained with specimens which were slowly cooled and quenched, respectively, after 1 hour's exposure to the specified temperature are given in table 37, while table 38 gives the results obtained with specimens annealed at the specified temperatures for 6 hours.

Broadly speaking, these results are analogous to those of the corresponding tests on sand-casting, the tensile strengths of the heat-treated rolled bars being in every case decidedly higher, notably in the case of No. 3A when quenched from 850° C.—1,562° F.—the tensile strength of 52 tons per square inch there recorded shares with the tensile tests on cold-drawn bars of the same alloy of the distinction of being the highest tensile strength yet observed in alloys of copper with aluminum or with aluminum and manganese. The elongation on 2 inches of the quenched specimen, however, is only 3.5 per cent, while that of

TABLE 35

No.	Composition	Treatment	Yield-Point	Ultimate Stress	Kinetic Ratio	Elongation Per Ct.
2A	9.87 1.01	Annealed at 550 (1,022° F.)	12.72	28.30	0.45	15.0
2A	9.87 1.01	Quenched at 550	13.60	31.80	0.43	18.5
2A	9.87 1.01	Annealed at 800 (1,472° F.)	13.20	29.16	0.45	17.0
2A	9.87 1.01	Quenched at 800	13.04	41.28	0.32	6.0
3A	9.99 2.01	Annealed at 550	11.00	32.15	0.34	15.0
3A	9.99 2.01	Quenched at 550	12.40	33.88	0.37	11.0
3A	9.99 2.01	Annealed at 850 (1,562° F.)	13.00	30.00	0.43	12.0
3A	9.99 2.01	Quenched at 850	18.00	41.08	0.45	5.0
6A	9.10 2.84	Annealed at 550	12.92	31.24	0.41	31.5
6A	9.10 2.84	Quenched at 550	14.40	31.80	0.45	31.5
6A	9.10 2.84	Annealed at 900 (1,652° F.)	10.40	27.04	0.38	49.0
6A	9.10 2.84	Quenched at 900	17.20	39.38	0.44	9.0

TABLE 36

No.	Al. Composition	Mn. Composition	Treatment °C	Yield- Point	Ultimate Stress	Elastic Ratio	Elong- ation on 2 inches Per Ct.
2A	9.87	1.01	Quenched at 800 (1,472° F.)	13.2	38.0	0.35	7.0
3A	9.99	2.01	Quenched at 850 (1,562° F.)	13.2	41.0	0.32	7.0
6A	9.10	2.84	Quenched at 900 (1,652° F.)	15.80	36.0	0.44	11.5

TABLE 37

No.	Al. Composition	Mn. Composition	Treatment °C	Yield- Point	Ultimate Stress	Elastic Ratio	Elong- ation on 2 inches Per Ct.
2A	9.87	1.01	Annealed at 550 (1,022° F.)	21.6	37.40	0.58	5.0
2A	9.87	1.01	Quenched at 550	20.4	39.4	0.52	16.0
2A	9.87	1.01	Annealed at 800 (1,472° F.)	15.3	34.6	0.44	31.0
2A	9.87	1.01	Quenched at 800	24.2	45.5	0.53	11.5
2A	9.99	2.01	Annealed at 550	22.2	39.0	0.57	7.5
2A	9.99	2.01	Quenched at 550	10.1	42.0	0.46	25.0
2A	9.99	2.01	Annealed at 850 (1,562° F.)	14.6	35.45	0.41	26.5
2A	9.99	2.01	Quenched at 850	25.2	52.0	0.48	3.5
2A	9.99	2.01	Annealed at 550	22.2	41.0	0.54	27.0
6A	9.10	2.84	Quenched at 550	20.3	41.2	0.49	39.8
6A	9.10	2.84	Annealed at 900 (1,652° F.)	12.6	31.8	0.40	43.0
6A	9.10	2.84	Quenched at 900	19.9	43.7	0.46	23.0

TABLE 38

No.	Al. Composition	Mn. Composition	Treatment °C	Yield- Point	Ultimate Stress	Elastic Ratio	Elong- ation on 2 inches per cent
2A	9.87	1.01	Annealed at 900° C. (1,652° F.) for six hours	12.9	31.8	0.39	29.0
3A	9.99	2.01	"	12.4	34.0	0.37	24.0
6A	9.10	2.84	"	12.45	30.9	0.40	37.5

the hard drawn bar is 10 per cent. A remarkable feature of the results given in table 37, however, is the very low value found for the elongation of rolled bars of alloys Nos. 2A and 3A after annealing at 550° C.—1,022° F. Annealing the rolled bars at temperatures above 800° C.—1,472° F.—however, does not injure the ductility of the material to anything like the same extent, although it brings about a more considerable reduction in the ultimate stress.

The results given in table 38, while slightly lower both as regards ultimate stress and elongation than those obtained from the same alloys with shorter periods of annealing, still serve to show that the condition of ultimate equilibrium attained after six hours does not differ very materially from that attained at the end of the first hour, while in the case of alloys Nos. 2A and 3A the increase of the annealing temperature from 800° C. and 850° C. respectively to 900° C. has not produced any very marked changes in the physical properties.

In connection with the effects of heat treatment on these alloys the authors thought that it would be of interest to determine approximately the temperatures required to bring about the annealing or softening of the hard-drawn bars. The scleroscope offers a ready means of making this determination in the approximate manner which was aimed at. With this instrument an indication of the hardness of the metal can be rapidly obtained from small specimens, and even if these readings be regarded as little more than qualitative indications they are sufficient to indicate the progress of the annealing process. Small specimens of the cold-drawn bars of alloys Nos. 2, 3 and 6, as well as a sample of commercial copper which had been rolled and drawn at the same time and in the same manner as the alloy bars, were accordingly prepared and exposed for periods of thirty minutes at various temperatures, the scleroscope hardness number being determined at the end of each of these periods, the same specimen being then exposed to the next higher temperature and again observed at the end of half an hour. The results found are given in table 39.

In the case of copper there appears to be a decided softening even after 30 minutes' exposure to so low a temperature as 250° C.—484° F.—but in the case of the three ternary alloys softening does not commence until the temperature of 400° C.—752° F.—has been passed, 550° C.—1,022° F.—reduces them to a condition approximating to that of the hot-

rolled bars, while higher temperatures soften them to a considerable further extent.

Fresh and Sea-Water Corrosion Tests

Cast specimens of the alloys, measuring 3 inches square by $\frac{3}{8}$ -inch thick, were machined to 2 $\frac{1}{2}$ inch square by 0.3 inch thick for the fresh-water tests and by $\frac{1}{4}$ inch thick for the sea-water tests.

Fresh-Water Tests

The specimens were suspended by string in such a way as to be completely immersed in a

TABLE 39

Hardness Number after 30 minutes' Exposure to a Temperature of

No.	Room	250° C. 484° F.	400° C. 752° F.	550° C. 1,022° F.	700° C. 1,292° F.	900° C. 1,652° F.
Copper	14.5	13.5	12	6	20	16
2	34.5	34.5	34.5	25	20	16
3	34	33.5	33	25	19	18
6	29	29	29	21.5	16	15

TABLE 40

No.	Alteration in Weight per cent per month of 30 days	Alteration in Weight per sq. ft. in lbs. per month of 30 days
00 alone	0.0005 loss	0.000026 loss
00 bolted to steel	0.0010 loss	0.0000935 loss
2 alone	0.0010 gain	0.000050 gain
2 bolted to steel	0.00046 loss	0.000040 loss
3 alone	0.00024 loss	0.000125 loss
3 bolted to steel	0.00076 loss	0.000064 loss
6 alone	0.0016 loss	0.000083 loss
6 bolted to steel	0.00048 gain	0.000042 gain

TABLE 41

No.	Alteration in weight per month of 30 days	Alteration in weight per sq. ft. in lbs. per month of 30 days
00 alone	0.022 loss	0.000895 loss
00 bolted to steel	0.0085 gain	0.000577 gain
2 alone	0.044 loss	0.00182 loss
2 bolted to steel	0.000	0.00
3 alone	0.0384 loss	0.00153 loss
3 bolted to steel	0.00044 gain	0.00003 gain
6 alone	0.00214 gain	0.000089 gain
6 bolted to steel	0.00021 gain	0.000015 gain

glass vessel containing ordinary clean tap-water, the tank holding about 3 gallons. One set of specimens was hung alone, while another set was bolted to steel plates which had been previously machined on the contact surface so as to ensure good contact; the contact surfaces were found to have remained bright and unaffected at the end of the experiments. Each specimen was suspended in such a way that there was no possibility of electrical contacts being formed outside the water. The water was changed once every 7 days, and the specimens were also cleaned by rubbing with a cloth and a paint-brush to remove the adhering slime, etc. The specimens were weighed, after careful cleaning, at the end of every month, the experiments being continued over a period of 102 days. The loss of weight of the specimens is shown in table 40 in terms both of percentage change of weight of the specimens and in terms of change of weight per square foot of exposed surface per month; the areas exposed were, in the specimens suspended alone 0.13 square foot, and in the specimens bolted to steel plates 0.077 square foot.

With regard to the appearance of the specimens exposed to fresh water, the surfaces of those which had been exposed alone remained bright or only very slightly dimmed, but those attached to the steel plates were found to be covered by a thin slimy deposit of what proved to be practically calcium carbonate. This observation—that a deposit of carbonate of lime is only formed on these alloys when subjected to galvanic action—throws an interesting light on the origin of the deposits of calcium carbonate frequently found on copper alloys in practice. The actual figures for the loss by corrosion in fresh water given above all indicate a very slight amount of corrosion; in two cases there is an actual gain in weight which may possibly arise from the presence of combined oxygen in the sample after testing, but it seems more probable that the somewhat gentle cleaning process was not sufficient to remove all adherent foreign matter, and that the weight of this foreign matter more than counterbalanced any minute loss by corrosion. A remarkable fact is that in the case of alloys Nos. 00 and 2, the specimen attached to the steel plate lost rather more than the one suspended alone. This is possibly due to a minute amount of abrasion during the process of removing the film of calcium carbonate just mentioned. The comparison of the results among themselves appears to show that No. 2 is superior to the pure copper-aluminum alloy as regards resistance to fresh water when exposed to it both alone and in contact with steel—in the latter circumstances, in fact, all three ternary alloys are superior to the binary alloy. No. 3, however, appears to lose at a considerably higher rate when exposed alone. In the present series of experiments, in fact, the entire effects of fresh-water corrosion are so small that they may almost be regarded as entirely absent.

Sea-Water Corrosion Tests

These tests were carried out in the laboratory in a manner very similar to that adopted for fresh-water tests. The glass tank used held about 2 gallons of sea-water which was changed approximately every three weeks, and the specimens were gently cleaned each time that the water was changed. The water was, however, violently stirred once every day. The duration in the test was 91 days. The observed changes of weight are given in Table 41 in the same manner as those for the fresh-water tests.

Special Experiments

It has been stated above that the alloys investigated in the present report have been prepared by the use of Thermite manganese or of cupro-manganese derived from this comparatively pure form of manganese. As there is a considerably cheaper source of manganese in the industrial ferro-manganese alloys the question arose whether it would be possible to utilize this relatively cheap industrial material as a basis for the ternary alloys here under investigation. The preparation of cupro-manganese from ferro-manganese was accordingly tried in the first instance.

A supply of commercial ferro-manganese was obtained, and this was found to contain 79.92 per cent of manganese. An attempt was made to melt this material with copper with a view to obtaining an alloy containing about 50 per cent of manganese. Eleven pounds of the ferro-manganese were melted with 8 pounds of copper in a Fletcher-Russell concentric furnace in the laboratory, in small batches; the resulting ingots were then melted up together and the molten metal was granulated by pouring into water which was kept vigorously stirred. For the purpose of protecting the molten metal from the atmosphere and also of effecting some refining of the ferro-manganese and the resulting cupro-manganese, these meltings were undertaken under a layer of slag consisting of borax saturated with manganous oxide—MnO—the surface of the metal being cleaned by means of graphite rods just before pouring.

(To be continued.)

Antigo, Wis.—Charles Fenn will build a public garage.

New Orleans, La.—The Gentilly Auto Co. has finished a garage in Canal street.

Haverford, Pa.—Metzger & Wells have a contract to build a \$10,000 garage for Clarence A. Warden.

Huntington, N. Y.—The North Shore Garage Co.'s new building is to be 50 by 225 feet, instead of 50 by 20 as first reported.

Omaha, Neb.—A. D. Foster has bought from Sherman & McConnell the brick garage occupied by the Electric Garage Co. at 2218 Farnum street for \$40,000.

Chicago—J. W. Tiscarnia, of Oakland, Cal., has removed to Chicago to associate himself with the Auto Specialty Mfg. Co., 79 Dearborn street, Chicago, as secretary of that concern.

Omaha, Neb.—The McIntyre Automobile Co. has moved into its new garage at 2203 Farnam street. The garage is a commodious one, with all the modern appointments, the building being 25 by 128 feet.

Kansas City, Mo.—The Broadway Garage and Sales Co., located at Thirty-fourth and Broadway boulevard, has taken the territorial agency for the Clark. R. B. Edwards and H. D. Biggs are proprietors of the new concern.

Pittsburg, Pa.—The Canfield Transfer Co. has started to operate a motor omnibus line between Canfield, O., and the public square, Youngstown, O. It expects to cover the 10 miles in 35 minutes. The company uses a four-seated wagon of the rubberneck type.

Racine, Wis.—The Racine Mfg. Co. has purchased two pieces of property adjoining its present holdings, to be used for the enlarged new plant that replaces the one destroyed by fire on December 12. The first new building, a four-story structure, is now being completed.

Greencastle, Pa.—George P. Lininger has opened a garage and repair shop. There are about twenty cars in the town, which is located on the old turnpike passing through Gettysburg, Waynesboro, Greencastle and Pittsburg, very well located to help cars over the direct route.

Lapeer, Mich.—The citizens of Lapeer have accepted the proposition of Thomas F. Ahern, of Detroit, to build a motor car factory in this city. The citizens agree to furnish a 10-acre site and to give a cash bonus of \$50,000. In return Ahern agrees to organize a motor car company with a capital of \$150,000.

Hartford, Conn.—The annual meeting of the Hartford Rubber Works Mutual Benefit Association resulted as follows: President, C. B. Whittlesey; vice-president, George Holloway; secretary, A. Elmer; treasurer, E. Fothergill. During the past 3 years that the organization has been in existence there has been paid out in benefits to members \$5,000 in cases of sickness

Brief Business



EXTERIOR OF NEW GARAGE OF ZELL MOTOR CAR CO., BALTIMORE

and death. The association has a membership of 500.

Sullivan, Ill.—The Sullivan Automobile Co. has moved into its new garage.

Salt Lake City, Utah—The Moyle garage building at 135-7 South State street is nearing completion.

Seattle, Wash.—W. C. Ruckman, who has for the past 3 years been the manager of the Seattle branch of the White Motor Car Co., has retired from the business and will be succeeded by Frank Jestrab.

East Orange, N. J.—The Union Motor Car Co., 304-310 Central avenue, has completed the erection of a large fireproof garage, immediately in the rear, in which a modern machine shop is being installed.

Appleton, Wis.—A large fireproof garage, built at a cost of \$25,000, will be leased by Harry Griffin and Chester Scott. The garage will be 50 by 125 feet in dimensions, one story high, of solid brick and concrete.

Springfield, O.—Owing to some technicalities, the reorganization of the Oscar Lear Automobile Co., which is now known as the Kelly Motor Truck Co., will not take place until May 2, 1910, when it is planned to increase the stock from \$100,000 to \$350,000. The two large additions to the plant are almost completed.

Washington, D. C.—The Wilson Co. is enlarging its salesroom at 1333 Fourteenth street to twice its present size. The work of remodeling the building at 1321-23 Fourteenth street for the Maxwell-Briscoe branch, is well under way. The Cook & Stoddard Co. took possession of its new salesroom at 1313 H. street, N. W., last week. Barber & Hill have leased a large

garage at the corner of Fourteenth and Irving streets.

Baltimore, Md.—The new garage of the Zell Motor Car Co. is ready. Tapestry brick with tooled concrete columns and trimmings compose the front. The roof projects over the third floor line in front and its large, semicircular, green tile covering adds a live dash of color to the structure. On the first floor is the showroom, 50 feet square. At the rear of the room are mezzanine offices. In one of the corners of the showroom is a complete accessory department; directly underneath are stockrooms for carrying spare parts, supplies and tires. Storage facilities are provided on the entire second floor, and

Recent Incorporations

New York—Washington Garage Co., capital stock \$5,000; to build, lease, buy and operate garages, etc. Incorporators, Nicholas Grunzfelder, Barbara Grunzfelder and August Welsing.

New York—Boulevard Auto Co., capital stock \$20,000, to manufacture motor engines, motor cars, etc.; incorporators, Emil N. Sorgenfei, William Peters and August Korsmeier.

Freehold, N. J.—Ocean Garage Co., capital stock \$10,000; to conduct garage; incorporators, George N. Duffy, Hubbard F. Weeks and Charles F. Mount.

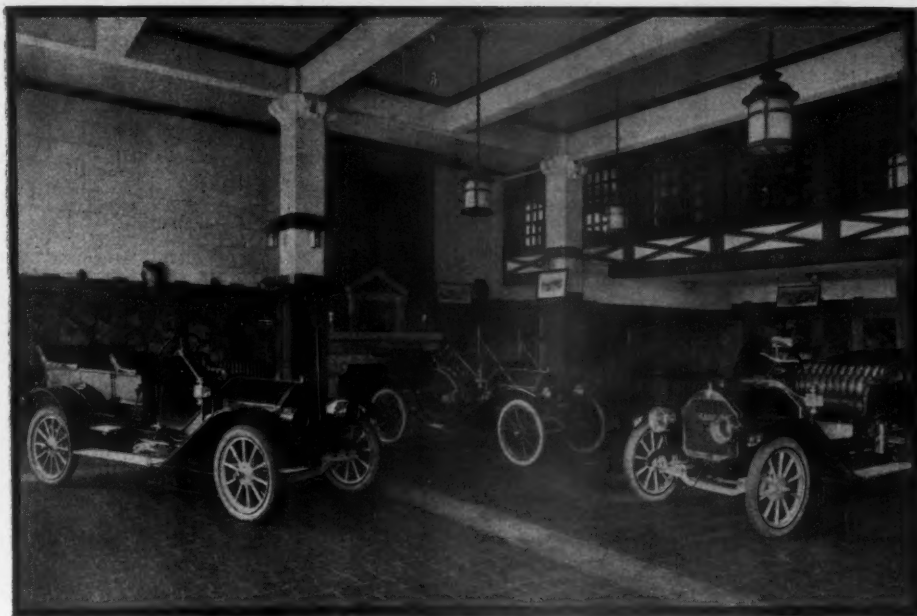
Jersey City, N. J.—Bloomington Rubber Co., capital stock \$100,000; to manufacture rubber goods; incorporators, George S. Mahanna, Ira W. Henry and Frank H. Hall.

Trenton, N. J.—Harmer Rubber Reclaiming Works, capital stock \$125,000; to reclaim rubber and manufacture rubber goods; incorporators, Joseph Gordon, Hyman A. Rosenthal and Thomas W. Harmer.

Buffalo, N. Y.—Chrisholm Sales Corporation, capital stock \$30,000; to sell motor cars, motor boats and supplies; incorporators, G. H. Chrisholm, H. L. Chrisholm, R. A. Kellogg, all of Buffalo.

New Rochelle, N. Y.—New York and New Rochelle Automobile Co.; to maintain and conduct garages, etc.; deal in and repair motor cars and accessories, etc.; incorporators, Milford Simis, Edward L. Walter and Leon Kaufman.

Announcements



SALESROOM OF ZELL MOTOR CAR CO., BALTIMORE

one-half of the first and third floors and most of the basement. On the third floor is a large shop.

East Liverpool, O.—The Auto Supply Co. has been incorporated with a capital stock of \$10,000 by Walter B. Hill and others.

Ft. Wayne, Ind.—H. W. Meyers, formerly with the Zimmerman Mfg. Co., has taken charge of the factory of the Randall Motor Car Co., Ft. Wayne, Ind.

Pittsburg, Pa.—The Cortland Transfer Co., which operated a successful line of cars between Cortland, O., and Warren, O., the county seat of Trumbull county, last summer, has resumed its service. It will also run a line from Warren, O., to Cham-

pion, O. A line also will be put on this month between Warren and Farmington-Bristolville, O.

New Orleans, La.—The Louisiana Motor Co. has completed its garage near Baronne and Julia streets.

Waterloo, Ia.—The Cadillac agency here has changed hands. It now is the Morris Motor Car Co., instead of the Rockwell-Peters Motor Co.

Toledo, O.—H. H. Findlay and Thomas A. Phillips have been added to the selling force of Hilt & Costello, Speedwell agents at Toledo. Mr. Findlay was formerly with the Ford company of Detroit.

Baltimore, Md.—The Franklin Automobile Co. has established a branch store in this city for handling the Franklin car. The branch is located at the corner of Mount Royal and Maryland avenues.

Dover, Del.—The Kanawha Chemical Fire Engine Mfg. Co. has organized to manufacture, buy, sell and deal in chemical fire engines, motor engines, fire extinguishers and fire equipment. The capital is \$400,000.

Bristol, Conn.—The New Departure Mfg. Co., of Bristol, is making additions to the big plant, which will afford an increase in floor space of 32,000 square feet. The foundations have also been laid for additional gas engine equipment.

Hartford, Conn.—F. S. Hyatt, purchasing agent of the Columbia Motor Car Co., and its predecessor in business, the Electric Vehicle Co., has resigned and has been succeeded by Lyman Smith, of this city. A farewell dinner was tendered him at the Hotel Heublein Thursday evening

of last week, at which Vice-president Henry W. Nuckols was the toastmaster.

New Orleans, La.—The Fairchild Auto Co. is building an establishment on St. Charles and Girod streets.

Hartford, Conn.—The Billings & Spencer Co. has just completed an emergency hospital in connection with the local plant.

Indianapolis, Ind.—The Maxwell-Briscoe Motor Co. is now located at its new three-story garage at Illinois and Vermont streets.

Pittsburg, Pa.—The Forbes Motor Car Co. has moved into its new location at 5706 Penn avenue. It has the agency for the Abbott-Detroit.

New York—Theo. H. Marburg, representing Mea high-tension magnetos and S. R. O. ball bearings, has moved to more spacious quarters in the Thoroughfare building at 1777 Broadway, New York.

Racine, Wis.—C. B. Latta, manager of the traffic bureau of the Racine Mfg. Co., has resigned to become traffic manager of the United States Motor Co. at Indianapolis, Ind. C. B. Kerr succeeds him at Racine.

Chicago—The Knight Equipment Co., with a capital stock of \$2,500, has been incorporated to manufacture and deal in motor cars, motor boats, aeroplanes, etc. The incorporators are Vincent Bendix, W. D. Jones, R. J. Jacker.

Oklahoma City, Okla.—a new garage with repair shop has been completed at Sixth and Walnut streets by V. W. Shaler, to be known as the Standard Auto Garage. Mr. Shaler has the agency for the Standard Six and Halladay cars.

Janesville, Wis.—The first Monitor commercial car built at Janesville was shipped by the Monitor Automobile Co. to its sales agency in Chicago last week for delivery at Memphis, Tenn. The new works at Janesville are running full capacity.

Philadelphia, Pa.—J. T. Sweeney, formerly connected with the Times Square Automobile Co., of New York, as purchasing agent, has branched out for himself under the caption of the Sweeney Auto Co., with offices and sales rooms at 208 North Broad street.

Philadelphia, Pa.—An open-at-night supply house is a recent Philadelphia innovation, the Penn Auto Supply Co., of that city, having decided to keep its branch at 1407 Filbert street open till midnight. The company's Atlantic City branch also will be open at night during the summer season.

Lawton, Ok.—The Powers Motor Car Co. is erecting a two-story building with concrete floors and all modern improvements. The building fronts on E avenue, besides the 75-foot frontage opposite the postoffice. There will be an entrance driveway for motor cars to the north, south and east, giving easy access and egress.

In the Motoring World

Dover, Del.—Black's Garage Co. of New York City, capital stock \$25,000; to manufacture, repair, sell and deal in motor cars.

Dover, Del.—Automobile Co. of Philadelphia, capital stock \$50,000; incorporators, J. H. Hughes, J. L. Wolcott, E. A. Price.

Dover, Del.—Hess-Bright Mfg. Co., capital stock \$1,000,000; to buy, sell and deal in the manufacture of alter ball-bearings for axles, trucks, railway rolling stock and motors. Incorporators, F. R. Hansel, George H. G. Martin and S. C. Seymour.

Bayonne, N. J.—Bearings Co. of America, capital stock \$1,000,000; to manufacture bearings, magnetos, carbureters and motor car accessories; incorporators, William B. Greeley, John W. Hertzler, Ambrose L. O'Shea, Edward F. Roehm, Charles V. Tuthill and Thomas A. Renwick.

Frankfort, Ky.—Capital Motor Co., Inc., capital stock \$3,000; incorporators, W. L. Williams, E. Williams, Joseph Seversance and Margaret Seversance.

Baltimore, Md.—D. C. Walker Auto Co., Inc., capital stock \$30,000; incorporators, Dixon Walker, Hamilton C. Walker, Edward P. Pendleton and James L. Lindsay.

New York—Cook & Wilkinson Co., Inc., capital stock \$25,000; to manufacture and deal in wagons, motor cars, bicycles, vehicles of all kinds and supplies for same; incorporators, William M. Blain, George E. Cook and Lyman M. Wilkinson.

MOTOR LOGIC DELIVERED BY HUGH CHALMERS

THE motor car business has been built up so rapidly, and particularly in Detroit, that the people of Detroit generally do not realize what the industry means. They take it as a matter of course. Visitors from outside marvel, and other cities envy Detroit. In order to realize what a tremendous industry it is, and how Detroit is affected by it, it is necessary for me to give you some facts and some figures, which I shall do as briefly as possible.

It is estimated that there are 150 motor car manufacturing companies in the United States. There are thirty-five companies in Michigan, with a total capacity of 140,000 cars annually. Twenty-three of these thirty-five companies are in Detroit, with a total annual capacity of 85,000 cars and a total capitalization of \$30,000,000. There are 38,000 people employed by motor car manufacturers in Detroit, and 19,000 employed by accessory manufacturers, making a total of 58,000 altogether engaged in motor work in Detroit. This means that more than 200,000 people in Detroit are dependent upon the motor business. Nearly \$1,000,000 weekly is paid out in wages here in Detroit by motor and accessory manufacturers.

Runs Into Millions

Nearly \$10,000,000 is invested in motor car factories in Detroit. The total value of Detroit-made cars this year will be about \$200,000,000. Detroit manufactures about 60 per cent of the national output of motor cars. The motor car industry is now the most stupendous of all manufactured products. Detroit formerly was proud of the fact that it made more stoves, more pills, more paint and more freight cars than any other city in the country. The volume of the largest of these products in dollars and cents—freight cars—amounts to about \$18,000,000 annually. The product of any two of the more prominent motor car companies in Detroit will easily total \$20,000,000 a year.

We were so used to speaking of motor cars in quantities of a thousand, and have become so familiar with them on the streets, that we forget that each represents a good deal of money, and that a few thousands of cars means the expenditure of a fabulous sum. The business has raised the standard of factory conditions, because it is a business which calls for good factories, because expert work must be done, and these factories must have the maximum amount of light and air. On account of its being a new business, it has called for the erection of new factories, and most of these factories have been built along the most up-to-date lines. Our state factory inspectors say that the new, light, healthful and convenient buildings which the motor car manufacturers have erected has led to better factory conditions in other lines of business.

What It Has Done for Detroit

The motor car business has made Detroit a great hotel town, and it also makes business better in every line. Think of the retail sales establishments and garages which the business has brought into existence. Do you know that the garage is the only new thing in architecture in several generations? Some of our new combination salesroom and garages are among the most handsome buildings in the city. Detroit has more cars per thousand population than any other city in the world, except Los Angeles. There is a saying that you can stand in the place de l'Opera in Paris and if you stay there a while the whole world will pass by. You can stand in a square of Detroit and the entire motor car business of the world will pass by, and you won't have to stand there very long either. The fortunes that have been made and are being made come rather through great volume of business than through the large profits that are made on the individual car.

People naturally ask, how long will the motor car business continue, and isn't it likely to be overdone? Now I am not a prophet and cannot tell just what is going to happen, but I believe that the motor car is not subject to any other comparison, because the motor car is the first improvement in individual transportation in centuries. It has replaced the only thing in our civilization that has been the same through centuries, and that is the horse; so that I think the car will be with us as long as the horse has been with us. But whether or not the public can take the output of some 200 companies is another question.

Predicts Survival of Fittest

The business is subject to the same laws and rules that any other business is subject to. It will, of course, result in a survival of the fittest. Those who have built the best cars at reasonable prices, and take proper care of the owners, have nothing to fear, in my opinion, from any question involving over-production provided they do not overproduce themselves. After all, the question of success or failure in the motor car business is the same as in any other business—the matter of personal equation constitutes about nine-tenths of it.

EDITOR'S NOTE—The following address was made by Hugh Chalmers, president of the Chalmers Motor Co., to the students of Detroit college April 14.

People used to think that any man who could lead a horse to water could run a farm, but they have changed their minds on that point. Some people seem to think now that any man who can build a motor car that has four wheels, that will run three blocks, can sell all the motor cars that he can build. This has been partly true in the past, but will not be in the future. Only those companies that make an honest car to sell at a fair price, and who are in the business to stay, can hope to succeed.

We are more or less confounded nowadays by a vast amount of advertising matter, and you could paste almost any name at the bottom of these advertisements and you could not tell whose ad it was, but the buying public is fast learning that advertising does not create value in motor cars any more than in anything else—it merely tells of it—and I think that the companies that are building cars today will be the companies that will be in business 3 years from now.

This is the day when the smart business man tells only the truth in his advertising

Atlantas' Garage Rates

Atlanta, Ga., April 16—Garage charges in Atlanta seem to be comparatively uniform and reasonably agreeable to car owners, judged by the comparatively small number of complaints. Runabouts are \$12.50 or \$15 per month at all garages. Two local garages make a straight rate of \$15 per month for all classes of cars except trucks. One charges \$18 per month for trucks and the other does not handle them. Only one company makes a special charge for roadsters. The charge of this concern is \$18 a month for vehicles of that class, with runabouts at \$15 and touring cars at \$20. For five-passenger and seven-passenger touring cars there are two prices—\$15 and \$20. One exception to the above rule does not charge according to the size of the car but by the number of times it must be washed. Any car that is washed but once a week is \$12.50. If two or three washings are required, the price is \$15. If the car must be washed every day the charge is \$20 per month. For limousines, landaulets and similar cars there is a wide variation, from \$15 to \$30 a month being charged. There is an equal variation in the charges for trucks. Practically all of the garages state that they much prefer not to handle any trucks at all. Those who will handle them quote prices ranging from \$15 to \$30.

The standard price for washing and polishing is \$1, though three local garages will do it for 75 cents. The standard price for dead storage is \$7.50 a month. However, a couple of firms make a rate of \$5 and three have a \$10 charge for big cars.

It is the general opinion of local garage men that there is not much money to be made at present prices. One large company went out of the general garage business January 1 because it found no money to be made in it and hereafter will handle only its own cars.

and then makes good all the claims of his advertising when he sells to the customer. A man may for a few months succeed in fooling people by his advertisements so as to the value of the goods he has to sell, but, mind you, I say only for a few months, because no one at this time of doing business can continue to succeed unless he is truthful in what he tells the people and then be honest in living up to these statements in his dealings with the people.

I have no patience or use for the advertiser who lies in his advertising, be he motor car manufacturer or any other manufacturer. It is not necessary that a man should tear down another to build up himself. It is not necessary nowadays to sell cars to claim to make the best car built and sell it for \$1,200. People know this is not true. I know it to be a positive fact that most standard manufacturers of motor cars today are giving value for the money, whether they are marketing a car for \$600 or selling one for \$6,000. The good manufacturer is today giving the buyer what he is paying for—a good car for a low price, or a better car for a fair price, depending upon the attention which is given to details entering into the construction of motor cars.

Many people get the idea that the motor car business cannot last because they read the advertisements of so many companies which claim big production, but most of these people do not begin to build the number of cars that they advertise they are building. Personally I never could see any advantage in such gross exaggeration of facts in advertisements, but of course each company must run its own business according to its own ideas; but it is fortunate for the public, and also for the companies, that they are building the number of cars that they say they are building.

Looks Into the Future

I believe that the motor business will be the leading industry of Detroit for more years yet than any of us will live, and I am not so fearful of a reaction in the present situation, because there are so many companies that are building good cars located here. Of course, many people figure that where money has been made, it still can be made, and the danger ahead of us is that too many people will get to thinking that way. Personally I would not take much stock in any new company that was just starting, because I believe the competition in the future is going to be keener by far than it has been in the past, and competition of course means the elimination of those who are unable to withstand it.

The motor car business requires more capital in the conduct of it than most people realize, and while the profits to successful manufacturers have been quite large in some instances, yet it must be remembered that the risks have been great in the business, and where large sums have been made it must also be remembered that large sums have been lost.

A company starting in to manufacture motor cars must first be sure that the model it expects to market is all right and will meet with the approval of the buying public. After this is done, it must make a guess as to how many cars the public will buy the first year, and then it must start buying materials anywhere from 6 months to 1 year in advance and begin to turn out cars according to the model. Now if a company decides to build 2,500 cars, and would only succeed in selling 1,000 cars, it is a far more serious thing to have 1,500 cars left on hand at the end of the year's business than anything else I know of, and the disaster that would follow any company's unsuccessful attempt to sell its product in such quantities would be tremendous.

Buyers Now Educated

The people who buy cars are, as a rule, better informed about the thing they wish to buy than any other class of people on earth. They can ask more questions about the construction of a motor car, and can talk more intelligently about it, and have given more thought to it, than to anything else they have ever bought. Why? To a very large extent a motor car is a man's toy. It is his plaything. It is the thing he plays with like the boy plays with his hobby-horse. He talks about it at the club, and he like to let his friends know that he knows something about the thing he is discussing, too. Hence, the increased knowledge on the subject on the part of buyers, and this very fact of knowledge will in time eliminate all companies and cars that don't deserve the public confidence. A man might own a typewriter or an adding machine for 50 years and never know or care what it was made of; but he doesn't own a motor car for 50 minutes until he wants to know what is inside of it. But this seeking after information on the part of buyers has made all motor car makers improve their product. It has brought more improvement in the construction of motor cars than anything else except, of course, races and contests.